Coffee price risk in East Africa: The Feasibility of Intermediating Price Risk Management to Coffee Farmers and Coffee Cooperatives in Ethiopia, Kenya, Uganda, Tanzania and Zimbabwe

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Coffee price risk in East Africa: The Feasibility of Intermediating Price Risk Management to Coffee Farmers and Coffee Cooperatives in Ethiopia, Kenya, Uganda, Tanzania and Zimbabwe

Prepared by the Economic and Social Institute,
Vrije Universiteit, Amsterdam (ESI-VU)
for the Common Fund for Commodities (CFC)

Contents

1 Preliminaries

1.1 Introduction

The terms of reference of this study require us to consider the feasibility and desirability of introducing risk management instruments into the coffee producing and marketing systems in Ethiopia, Kenya, Tanzania, Uganda and Zimbabwe. The structure of the report is set out below.

The remainder of the current chapter contains the formal terms of reference of the project, details of related CFC projects in these countries and the names of the team of consultants for this project. In Chapter 2 the objective of commodity risk management and the types and potential users of commodity risk management instruments are considered, along with the choice of instruments. Next, in Chapter 3 a description is provided of the coffee sector in the five national economies, the position of producer cooperatives, the commodity & marketing chain, points of constriction and potential foreign exchange restrictions to price risk management. Then, in Chapter 4, we move to possible risk management transactions in the countries under consideration and, in Chapter 5, we evaluate these transactions and order them in terms of feasibility. From this chapter a country-transaction combination may be selected to be recommended for implementation on a pilot basis. The annex provides quantitative background material on area, population, macroeconomic factors and infrastructure.

1.2 Terms of Reference

The Common Fund for Commodities requested us the ESI-VU consultants to analyse the requirements and the potential for introducing market based risk management instruments suitable for the liberalised coffee markets Ethiopia, Kenya, Tanzania, Uganda and Zimbabwe. The CFC envisages that the coffee sector price risk management instruments will be tested in one or two pilot locations that provide the best enabling environment. The CFC required that the analysis should also address to what extent crucial conditions for piloting risk management instruments in the target locations exist. The consultants are required to take account of the legal and regulatory framework in each country.

After presentation of a report to the CFC, the consultants are expected to organise, in consultation with the CFC, a Regional Workshop on Coffee Price Risk Management at which the results of the work will be discussed with other experts and key stakeholders.

Specific terms of reference were as follows:

a) To identify and evaluate suitable price risk management instruments taking into consideration the specific country and local conditions for small farmers and/or their cooperatives.
b) To identify and contact potential service providers of price risk management instruments.
c) To discuss and work out the operational modalities of linking the price risk management instruments to input credit and/or warehouse receipts so that the instruments can be attractive to both farmers and local or regional financial institutions.
d) To provide cost estimates for providing price risk management instruments to farmers or their cooperatives, small traders and input providers.

e) To comment on the country-specific potential risks to the introduction of price risk management instruments.
f) To review the exchange control regulations and identify where changes would be required before the introduction of price risk management instruments.

The CFC requires a final report which should contain

a) A well-elaborated proposal to pilot price instruments in a suitable pilot at one or two locations which clearly shows how the instruments will be applied and by whom.
b) Identification of such pilot location(s) including assessment of the cooperatives involved.
c) An overview of the legal framework and the exchange control regulations and to what extent these are conducive to the introduction of price risk management instruments.
d) A report on the potential service providers.
e) Costs of these instruments under different scenarios (e.g. risk profiles, duration, time of the crop cycle etc.) and how these costs should be met.
f) Identification of suitable cooperatives and Local Transmission Mechanisms (LTMs) and recommendation for a potential Project Executing Agency to conduct the pilot testing.
g) Recommendations on how to overcome constraints identified including those for capacity building (training and support) for the identified partners of the project.

This document is the draft version of this report.

The CFC further requires:

- A comprehensive report on the findings and recommendations to be presented at the Regional Workshop on "Opportunities and Constraints of Introducing Price Risk Management Instruments" for coffee at the pilot location(s).
- Preparation of the programme of the Regional Workshop, identification of participants, suggestions for the venue, elaboration of logistics, participation in the workshop and preparation a summary report of the workshop.

1.3 Related CFC projects

The CFC has asked that the consultants assess the feasibility of price risk management in coffee in relation to and combination with existing initiatives of the CFC. These initiatives comprise the Input Credit Scheme (ICS/CFC) to be implemented in Kenya and the Warehouse Receipt Scheme (WRS/CFC) to be implemented in Tanzania, Uganda and Zimbabwe.

A workshop held in Nairobi in April 2001 selected **Kenya** for running a pilot on the ICS/CFC. Among the group of countries that have been considered Kenya has been identified as most suitable for running the pilot because it is more advanced in structured finance for commodities, particularly coffee. Following this workshop a Final Appraisal Report was written containing, amongst other things, a description of the pilot project to be implemented as well as its organization and management (see CFC, 2001).

The objective of the WRS/CFC is to establish a legal structure that will establish the collateral value of coffee stored in designated warehouses: with an official property title stocks of coffee may be used as guarantee for loans. Banks are intended to accept these warehouse receipts as guarantees for loans, with the consequence that they will lend to a greater extent and on more attractive conditions than they are doing currently, without warehouse receipts. The

Warehouse Receipt Scheme does not address inventory value and price risk management therefore complements the proposed facility.

In **Uganda** the WRS / CFC has not yet started. However, considerable progress has been made: a bill has been prepared to clarify the legal position. It is hoped that this bill will be enacted by the end of 2002. The system calls for an independent warehouse manager. Currently, banks do not lend enough on basis of stocks to make that expense worthwhile.

In **Tanzania** a draft legal framework for the WRS / CFC has been prepared. It is planned that the draft framework will be discussed in the Tanzanian parliament with the intention that it will pass into law in October 2002. The WRS / CFC cooperates with six banks for implementation of their scheme[1]. The majority of these banks has been involved in activities involving warehouse guarantees using inventory to collateralise lending but without an adequate legal framework. Banks also have shown interest qualified warehousing at the processing stage. CFC staff has selected a number of areas and warehouses for implementing a pilot[2]. Furthermore, international collateral managers have been approached to provide services[3]. These collateral managers appear to be expensive, but there are clear perspectives of economies of scale as the collateral manager charges a fixed fee per warehouse. Less expensive local companies involved in collateral management tasks are often not acceptable to banks[4].

Coffee farmers in Tanzania may only benefit from the warehouse receipt scheme if they are organised in farmers' associations or farmers' groups[5], but traders may benefit also on an individual basis. With a warehouse receipt a cooperative, a farmers' group, or a trader may borrow up to 60% for a period of three months, possibly twice.

In Kenya it is widely believed that establishing a legal framework underlying a warehouse receipt scheme would greatly enhance the credit and financing opportunities at various levels of the marketing chain. This would even more be the case if a price risk management scheme is operational. In Tanzania most commercial banks acknowledge that the planned WRS/CFC should improve the scope for farmers and primary cooperative societies to obtain loans. There is good complementarity between warehouse receipts and price risk management (the warehouse receipt guarantees quantity, while the price risk management guarantees value of the stock) and most banks and other credit providers have shown interest in a combination of these two.

1.4 ESI-VU Team

The team of consultants responsible for this study comprises:
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Professor dr. Christopher L. Gilbert (ESI, Vrije Universiteit, Amsterdam)
Dr. Jan ter Wengel (ESI, Vrije Universiteit, Amsterdam)
Dr. Wouter Zant (ESI, Vrije Universiteit, Amsterdam)

[1] EXIM Bank, Standard Chartered, Cooperative Rural Development Bank, Kilimanjaro Cooperative Bank, Stanbic Bank and National Bank of Commerce
[2] Kilimanjaro, Arusha, Mbeya, Riuvuma, Kigoma and Kagera.
[3] Amongst others Baltonic Cargo Superintendence (BCS), Audit, Control and Expertise (ACE), and Société Générale de Surveillance SA (SGS).
[4] Although highly regarded international collateral managers deliver a comparable 'product' as domestic ones, banks clearly prefer the international companies, because a law suit against an international company will prove to be effective as they need to maintain a good reputation and domestic companies may lack the funds to pay any penalties imposed.
[5] There more than 100 farmers associations, registered under the Ministry of Home Affairs (primary societies are registered under the Ministry of Cooperatives and Marketing).

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2 Commodity Risk Management – Principles and Instruments

2.1 Objectives of commodity risk management

Risk relates to strongly adverse outcomes of uncertain commercial processes. The *Shorter Oxford Dictionary* defines "risk" as (1) "hazard, danger; exposure to mischance or peril" and (2) "the chance of hazard or commercial loss, specifically in the case of insured property or goods". This definition makes it clear that, in normal parlance, risk is associated with unfavourable outcomes, in contrast to uncertainty that can relate equally to favourable and unfavourable outcomes.

The objectives of commodity risk management are the reduction of the risk experienced by the various actors in the commodity production and marketing chain. These objectives differ depending on the identity of the actors concerned and the risk to which they are exposed. In what follows, we consider three major objectives:

- reduction of revenue uncertainty;
- securing margins;
- credit enhancement.

The distinction between reduction of revenue uncertainty and securing a margin will be crucial to the discussion of choice of instruments in what follows.

2.1.1 Reduction of revenue uncertainty

The primary risk management objective for coffee farmers is to reduce the uncertainty associated with their futures revenues from the sale of coffee. The major component of this risk is that these revenues will be insufficient to cover expenditure commitments. Informal evidence indicates that the most important of these expenditures for African coffee smallholders are payment of school fees and meeting hospital and other medical expenses. To state the obvious, coffee farmers do well when the coffee price is high and badly when it is low. The same will also be true of governments to the extent that they participate in high coffee revenues through proportionate export revenue taxation.

There are two components to a farmer's revenue uncertainty: crop (yield) uncertainty and price uncertainty. These two sources of uncertainty may in certain circumstances be mutually offsetting if, for example, a crop shortfall in a major producing country is associated with a rise in the world price of the commodity. Automatic insurance of this form may be apply to farmers in producing countries with a high share in world exports, but even in these cases, only if there is a large degree of commonality in the yield shocks facing different farmers. It is possible that this description does characterize the position of Brazilian coffee farmers, but it appears *a priori* unlikely that coffee farmers in any African producing country are in this position. In general, therefore, it is reasonable to take these two sources of risk as independent.

Different instruments are appropriate for countering yield and price risk. In this report, we will be concerned entirely with price risk management. It follows that an important element in judging the effectiveness of any price risk management programme will be an assessment of the relative importance of price and yield risk in the farmer's overall revenue risks.

2.1.2 Securing margins

Once we move up the commodity chain from farmers, we encounter a succession of agents who purchase coffee in order to sell it at a profit. These agents include cooperatives, traitants (local traders), intermediaries, shippers, and the coffee roasters. We refer to the entire set of such agents as traders. Unlike farmers, who are interested in the absolute level of the coffee price, traders are concerned only with the margin between their purchase and their sale prices. While it is true that there may be a positive relation between the level of coffee prices and the margins obtainable in the coffee chain, it is clearly possible for a trader to obtain a high margin when the coffee price is low or equally, a low (even negative) margin when the price is high.

Margin risk arises because traders will not normally be able to buy and sell coffee at the same time, i.e. on a back-to-back basis.

- Traitants will buy coffee up-country and transport the coffee to the port or railhead, possibly undertaking some processing en route. They are vulnerable to any fall in the price of coffee over the intervening period.
- An exporter who purchases coffee at the port or railhead will need to find a buyer for this coffee. Alternatively, he may sell coffee to his buyer in advance of purchasing the beans from a traitant. In the former case, he is vulnerable to a fall in prices before he makes the sale, while in the latter to a rise in prices before he makes the purchase.

2.1.3 Credit enhancement

Access to credit is a major problem throughout agriculture in developing countries and this applies also to the coffee production and marketing chain. Few traditional banks are prepared to undertake business with coffee farmers or cooperatives, traitants can generally only obtain finance from exporters, and in many countries non-integrated exporters also experience difficulties in accessing finance.

All parties in the coffee sectors of the countries we visited (farmers, cooperatives, auctions, coffee organizations as well banks and other institutions involved in funding farmers or cooperatives) stated to us that access to crop finance is extremely difficult for farmers and cooperatives. Among the problems mentioned were:

- Banks lack the capacity, know-how and network to monitor the agricultural sector.
- Farmers and cooperatives are unable to provide adequate security for loans.
- A history of poor repayment has resulted in banks becoming reluctant to embark on coffee-based lending.
- These problems are aggravated by current low coffee prices.
- In general terms, banks will lend to clients either on the basis of collateral or reputation. The most important element of reputation is credit history. Because a large proportion of the actors in the African coffee chain has not established any useful credit history, credit availability depends crucially on the availability of collateral. Suitable collateral may include (in broadly decreasing attractiveness)
- inventories of coffee held in a secure warehouse
- other realizable and relocatable assets
- prospective (unharvested) coffee
- real estate.

Because smallholder farmers can generally only offer prospective crop and real estate as collateral, and neither of these is attractive to banks, they will typically be excluded from commercial borrowing. It is possible, however, that they may obtain credit from one of the growing number of microfinance institutions that are extending into the coffee-producing areas of Africa. Large farmers, farmer associations and cooperatives are often in a better position and can offer coffee inventory and relocatable assets as collateral. Traitants are often pre-financed by exporters on the basis of their reputation. Independent exporters can borrow on the basis of coffee inventory, relocatable assets, real estate and reputation. Integrated exporters have access to funds from their parent companies.

The CFC Warehouse Receipt and Input Finance schemes, discussed in Section 1.3, address these credit problems directly. The Warehouse Receipt Scheme aims to increase the collateral value of coffee held in recognized warehouses, while the Input Finance sets out to provide finance directly to participating cooperatives.

2.2 Potential purchasers of risk management

2.2.1 Smallholder farmers

The revenue uncertainty problem faced by African smallholder coffee farmers, notably the risk of revenue shortfalls, has been discussed in Section 2.1.1. We have also noted that coffee smallholders in Africa have very limited access to credit from traditional banks.

Farmers can respond to the risk of revenue shortfalls in a number of ways:

- They can aim to dissave from accumulated credit balances in the event of a shortfall. This implies that they should save in times of high revenue.
- They can diversify their efforts and resources across a number of crops.
- They can rely on mutual support from family and/or village members, incurring the obligation of providing the same services on a reciprocal basis.

In practice, farmers do all these.

Saving and dissaving offers significant expenditure smoothing prospects over time but relies on the existence of convenient and reliable banking institutions and on a secure anti-inflationary environment. Although the latter requirement is satisfied in the majority of the east African countries considered in this study, banking institutions have relatively low penetration. Low penetration limits saving possibilities, and coffee farmers tend therefore to save by investing, often in property improvement. Although these investments are valuable, opportunities for subsequent disinvestments are limited, and as noted in Section 2.1.3, farm property typically has highly limited collateral value.

African smallholder farmers are almost invariably highly diversified even if they typically produce only a single export crop. This diversification ensures that, however low cash income from sale of the export crop, the family has sufficient food both for its own purposes and for sale on local markets for purchase of other necessary subsistence goods. However, diversification comes at a cost. Intercropping is held to reduce coffee yields not only by diverting land and effort to other crops, but also because yields per tree will decline. Diversification therefore extracts a significant insurance premium through loss of the benefits of specialization and scale. More generally, if one believes that the future in robusta coffee production is highly uncertain, reinforcement of the situation in which African producers rely

on highly diversified smallholders suggests that it will be difficult to maintain competitiveness with those countries that can obtain the benefits of scale and specialization.

Diversification also introduces a further element of risk. The smallholder must decide to which of these crops he commits time and effort. He must also decide on elective expenditures on his coffee crop, ranging from outlays for fertiliser, herbicides and pesticides and other material inputs, to wage payments for pruning, weeding, mulching, and finally for picking cherries. These costs of production are made in the expectation that they will be covered by the revenues of the coffee once the harvest is sold on the market. It can be shown that the farmer will under-allocate effort and inputs to the crop with the uncertain price relative to the situation in which the price is known in advance.

Mutual insurance is similarly costly. In particular, mutual insurance diminishes incentives for investment and productivity enhancement since the costs of these investments fall entirely on the originator, while the benefits are likely to be extended throughout his extended family and/or village. Systems of mutual insurance are one of the features which give African society its strength and resilience, but at the cost of retarding incentives for development.

2.2.2 Cooperatives and farmer associations

Farmers associations and cooperatives can either act as agents of their farmer members or as more conventional intermediaries. In the former case, they will sell coffee on behalf of their members. In this system, smallholders typically receive a down-payment on delivery of their beans to the cooperative, and a bonus subsequently once the coffee is sold to a final buyer.

The alternative arrangement is for the association or cooperative to purchase the coffee outright from the farmer members in the same way as a commercial buyer. Competition with commercial buyers will generally require that the association pay the full price up-front, but it may be possible for the association to make an initial payment as in the previous case. This is equivalent to farmers depositing a proportion of their revenues with the association.

The nature of the risk management problem faced by the association or cooperative depends on which of these systems pertain. However, although the two systems are conceptually distinct, in practice it may not be entirely clear which of them a particular association is operating.

In the former case, in which the cooperative or association markets its members' coffee on their behalf, it does not carry risk in its own right and, to that extent, does not have a risk management problem. Instead, cooperatives and farmer associations provide a possible transmission mechanism for the intermediation of risk management instruments to its farmer members. In the alternative case, in which the association has purchased coffee from the smallholders for onward sale, it faces the margin security problem in the same way as other commercial intermediaries.

2.2.3 Local traders (traitants)

In fully liberalized systems, local traders buy coffee beans from farmers, typically as parchment, and sell to exporters at the port or railhead. We use the French term traitant to distinguish local traders from other traders. Note that in certain African coffee-exporting countries, most notably Kenya, private traders are not permitted to purchase coffee from smallholder farmers.

In markets with liberalized coffee purchase, a number of organizations are likely to compete for the farmer's coffee:

- cooperatives or farmer associations
- traitants
- agents for or local offices of exporting companies.

In practice, however, there may be little difference between the situation of traitants and exporters' agents since these agents often have a large degree of independence (in any case, they cannot be closely monitored) and may sell at least part of their coffee to whichever exporter offers the best price. At the same time, many traitants may have established selling arrangements with particular exporters and may, further, be prefinanced by these companies. The risk situations of these two groups is similar – they are obliged to commit a price to farmers prior to selling to the exporters and are therefore vulnerable with regard to their margins. In particular, they are exposed to a short term downward movement in price over their holding period, which will not normally exceed two weeks and will generally be considerably less than this.

2.2.4 Exporters

Exporters buy at the port, railhead or auction, directly from cooperatives and large (estate) farms, or directly from smallholder farmers through an agency or local buying station. There is an important distinction between integrated exporters, who buy on behalf of a multinational parent who will typically be a coffee roaster, and independent exporters who sell to final buyers. The role of the integrated exporter is confined to buying and making the arrangements for shipping and delivery. The independent exporter performs these functions but, in addition, must also find a buyer for his coffee and negotiate a sale price. Independent exporters are often smaller and less well financed than integrated exporters, although this is not always the case for high quality arabica or for niches in other markets.

Independent exporters face a timing problem. A back-to-back sales policy can never be extremely precise and an exporter may require a significant time either to find a buyer for coffee he has already purchased, or a seller to provide him with the coffee he has already sold. Even when buyers and sellers can be matched, the exporter may find himself "warehousing" (i.e. carrying) a residual long or short position if the quantities bough and sold do not match. This activity therefore requires significant trading skills as the exporter balances the price risk of warehoused exposure against the advantage of waiting for a better price. An exporter who gives high priority to offsetting his risk position is likely to make lower profits on average than an exporter who is willing to carry a larger element of risk.

By contrast, integrated exporters do not face a major risk management problem. Their price exposure will typically be covered by the parent company which will have easy access both to credit and to risk management instruments on international markets. Furthermore, the effective margin which concerns integrated companies is the margin between roast and soluble coffees and bean purchase price, not that between a negotiated cif sale price and the purchase price. These margins are both wider and more easily controlled than the purchase-cif margin.

2.3 Price Risk Management Instruments

2.3.1 Forwards contracts and futures

A forward contract is any contract made at one date but which specifies execution at a future date. Once one moves away from the store or the street market, most business contracts have this form since immediate execution in seldom possible. In practice, the term forward contract is therefore reserved for contracts which specify execution a significant time ahead.

Forward contracts allow the parties either to fix the price at which the eventual delivery will take place or to leave this open. In the former case, the delivery price is agreed at the date of the original sale. This price will be based on the terminal market price (LIFFE in London for robusta, the NYBOT in New York for arabica) at or shortly after the intended delivery date, moderated by a premium or discount reflecting the attractiveness of the origin in question relative to the terminal market, and a premium or discount relating to bean quality. This arrangement secures the exporter's price and transfers the entire price exposure to the importer. At this stage, the exporter has no further price risk management problem.

The alternative system is for the forward contract to specify a terminal price at or after the date of delivery. This price remains unknown at the date the contract is negotiated and so that element of price risk remains with the exporter. Instead, contract negotiations focus entirely on the differential, with the price being fixed at say £30 above LIFFE or $40 above the NYBOT. This type of forward contract is known as a "contract for differences" or "against unknown".

Practice in the coffee industry is for independent exporters or shippers to negotiate fixed price forward contracts with importers (roasters or traders) in the consuming countries. Integrated and other multinational exporters follow a greater variety of practices, depending in part on the legal separation of the parent and the origin exporter. Where that link is close, the origin purchasing companies function is often limited to purchase and shipping, leaving the management of price exposure to the parent company in the consuming country. The parent is able to do this taking into account its global exposure both in terms of coffee purchases and sales.

2.3.2 Futures contracts

An exchange futures contract is a particular type of forward contract.

- It is standardized in terms of quantity, grade and delivery date.
- It is tradable on a recognized futures exchange.
- If held to contract maturity, it requires the long party to deliver to a specified exchange warehouse (or warehouses) on a particular date, and the short party to take delivery from that (those) warehouse(s).
- Contracts are intermediated by a clearing house. This implies that the only counterparty risk is that pertaining to the clearing house and allows futures to be freely negotiated on an anonymous basis.
- Contracts are marked to market on a daily basis. A rise in the relevant futures price implies a profit to the long and a loss to the short. The short is required to pay this loss into the clearing house overnight, and the long is similarly either automatically credited his profit by the clearing house or is entitled to withdraw this profit form the clearing house. In practice, these margin payments are made by brokers on behalf of their clients from escrow variation

margin accounts established for this purpose, and the client's obligation is limited to maintenance of the required variation margin.

Contract specifications typically make delivery to exchange warehouses unattractive for purposes of commercial marketing, and purchase from an exchange warehouse inconvenient and unreliable for supply. This is true in coffee as in most other traded commodities. The purpose of the delivery provisions in futures contracts is to tie the futures price to the price of the physical commodity and not to provide a delivery function *per se*. Futures contracts are therefore almost invariably closed out prior to the contract delivery date.

The fact that futures contracts are not held to delivery implies that they complement and do not substitute forward contracts. Futures contracts are held either to hedge out price exposure or to speculatively assume additional price exposure. The two major coffee futures exchanges are LIFFE in London, which trades robusta futures, and the New York Board of Trade (NYBOT) which trades mild arabica futures. We discuss these markets further in Section 4.1.

US regulatory parlance refers to "commercial" users of commodity futures contracts as entities who have an underlying physical position in the commodity. A coffee commercial who is long the physical, for example an independent coffee exporter selling against a contract for differences, is at risk from a fall in the coffee price. By selling coffee futures, this company can offset its long price exposure. Similarly, a commercial who is short the physical, for example a roaster who is importing against a fixed price contract, stands to lose if the price rises. He can offset his short exposure by taking a long coffee futures position. The general futures hedging principle is that the required futures hedge is opposite in sign to the physical exposure.

One way of considering the difference between forward and futures contracts is that futures unbundle the risk management and marketing functions of fixed price forward contracts. A fixed forward coffee export contract obliges the importing company both to take delivery of the exported coffee beans and to assume the long coffee price exposure. The alternative arrangement is that the exporter negotiate a contract for differences which leaves him with the price exposure, and then offsets this through sale of the required number of commodity futures.

Hedgers use commodity futures to reduce their risk exposure. By contrast, speculators, referred to as "non-commercials" by US regulators, have no physical interest in the coffee trade, and take on a long or short futures position either with a view on expected future movements in the coffee price, or for reasons of portfolio diversification. Non-commercials provide the market liquidity against which commercials can trade.

An important feature of both forward and futures contracts is that they are symmetric with respect to rises and falls in prices - for a short, who has sold the future, a subsequent fall in the commodity prices implies that, *ex post*, he will have profited relative to the unhedged position, while a rise in the commodity price implies that he will have lost money relative to the unhedged position. We may characterize these contracts as variance-reducing.

A health warning is also important. Beyond pure hedging transactions, trading in forwards or futures has the potential of generating very large profits, but equally, very large losses. A large number of enterprises, including parastatal commodity organizations in developing countries, have incurred large losses through unauthorized futures trading. These losses have typically resulted when traders or enterprises have assumed risk-increasing positions under the guise of hedging, which is necessarily risk-reducing. The lessons from these losses is that forward and futures trading presupposes the existence good management information systems and strong

management controls. Controls of this sort require that management understands the operation of commodity futures markets.

2.3.3 Straight options and price floors

Purchase of a commodity options contract gives the purchaser the right, but not the obligation, to purchase or sell the specified commodity future at a specified "strike" price. "Call" options give the right to purchase the commodity futures, while "put" options give the right to sell. This right will only be exercised if the option is "in the money" - for a call, if the market price is above the call strike price, and for a put if is below the strike price. Options may either be exchange-traded or "over the counter" (OTC) – see Section 2.3.6.

We will typically be considering agents who are long the physical commodity (coffee) and who are therefore at risk in the event of a fall in the coffee price. This will apply to coffee farmers and to some extent also to cooperatives. Purchase of a put option guarantees the purchaser that he will obtain at least the strike price on the specified quantity. Puts therefore are equivalent to putting a floor on the price received on the ensuing physical transaction, and OTC puts are often referred to simply as "floors".

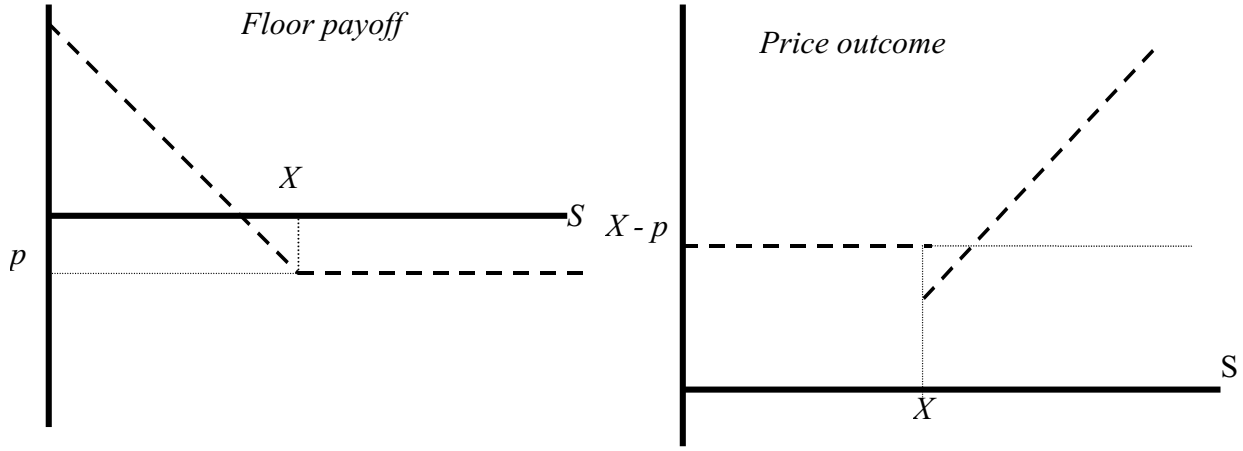
We have already seen that the party which is long physical coffee can offset its price exposure through forward or futures sales. There are two important differences between puts-floors and sale of futures or futures.

- We have noted that forward and futures provide have a symmetric variance-reducing impact on price variability. Puts and floors, by contrast, give asymmetric price protection in that the purchaser eliminates the unfavourable downside price movements while maintaining the benefit of upward price movement.
- We have also noted the fact that futures trading can result in very large losses. However, the maximum amount of money that the buyer of an option contract can lose is the option purchase price. Management issues are therefore less serious than with futures provided the risk management strategy is limited to the purchase of options.

The seller of a put or an OTC floor will require payment. This contrasts with the situation with a forward or futures contract which has zero initial cost – at the initial date, the contract does not benefit one party at the expense of the other so no compensation is required. In the case of the forward or future, the long profits are at the expense of the short if the price rises, but loses at his expense if the price falls. In the case of the option, the purchaser can only benefit, since an out-of-the-money option will not be exercised. Consequently, the seller requires payment for taking on this risk.

The payoff from straight purchase of a price floor in this manner are illustrated in Figure 2.1 (left panel). Here, S is the price of the underlying commodity and the floor is defined at strike price X. The floor costs p. The floor purchaser pays p in every case. However, if the commodity price turns out to be lower than X, he receives X-S. The right panel of the figure illustrates that return to the combined position in the underlying asset with (ton for ton) floor protection. The floor guarantees a price of X-p, but the upside potential is retained net of the option premium p.

Figure 2.1 Payoff from purchase of a floor (put option)



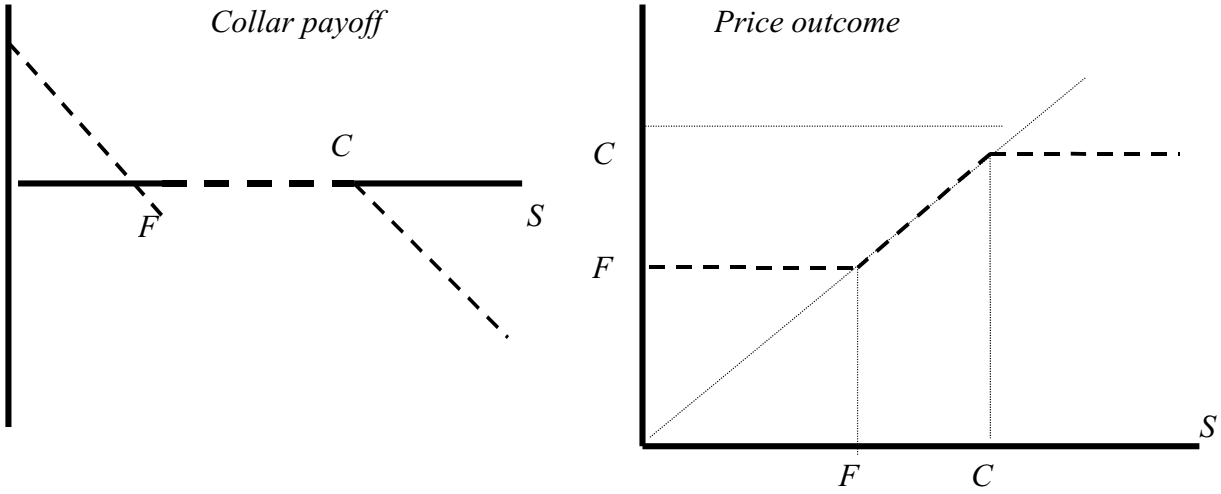
The payment method for option purchase depends in part whether the option is purchased on an exchange or over the counter. The standard payment method for OTC options is as an up-front payment. However, the broker or bank concerned may be prepared to finance the option purchase on a credit basis against the anticipated revenue from sale of the physical commodity. On the other hand, exchange options are typically margined in terms of futures equivalents.[6] The purchaser therefore pays the price over the lifetime of the option, so that, if at expiry the option is not exercised, he will have paid the entire price. If, on the other hand, the commodity price falls moving the option into the money (or further into the money) payment will never be required but instead will be financed out of the profit obtained on exercise.

2.3.4 Collars and participatory collars

OTC floors may also be financed by the purchaser writing a call option against part of all of the specified quantity. A symmetric "collar" option involves the floor purchaser accepting a ceiling on the price so that the seller of the collar benefits from any price rise above the ceiling. This is illustrated in Figure 2.2 where the collar imposes a floor price *F* in exchange for a ceiling price *C*. The right hand panel shows the resulting price outcome which resembles that intended by buffer stock stabilization schemes. (The difference is that an OTC collar gives the floor and ceiling only for the contracted quantities, while buffer stock stabilization relates to all production.)

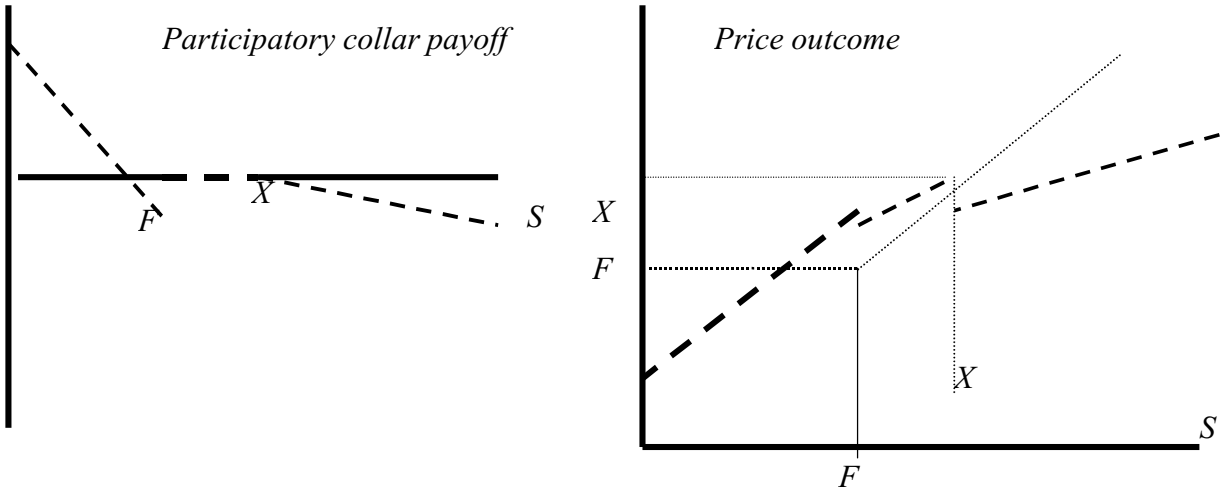
[6] i.e. the number of futures contracts which would give the same price protection as the option for a small price movement. This is the so-called option delta. The delta will change as the price of the underlying commodity futures changes.

Figure 2.2 Collar payoff and price outcome



Alternatively, the ceiling may be written on a smaller quantity but at a lower price, so that the floor purchaser maintains part of the benefit of a high price. This is illustrated in Figure 2.3. Here, the floor price is *F* as in Figure 2, but the ceiling, now *X*, only applies to a fraction, here half, of the contractual quantity, allowing the collar purchaser to retain the upside price potential on the other half. In order to compensate the provider of the option, it is necessary that *X* be lower than the ceiling price *C*. One way of thinking of this is that, in this case the collar purchaser pays for the floor through a 50% tax rate at prices above *X* whereas in the previous case, he paid through a 100% tax at *C*.

Figure 2.3 Participatory collar payoff and price outcome



A general feature of the collar schemes is that they raise performance issues for the option seller. This is because the holder of a collar or a participatory collar has an incentive to default on the contract in high price periods, since by defaulting he avoids paying the revenue tax which covers the collar purchase price. In this respect, contracts of this sort have the same features as credit provision.

2.3.5 Commodity Swaps

Commodity swaps involve one party exchanging the stream of revenues from sale of a specified quantity of the commodity in which s/he is concerned for the stream of revenues associated with another commodity. An example might be a coffee for grain swap. This would involve the government of a coffee-exporting country with coffee revenues making over part of these revenues in exchange for a coffee-importing country's grain export revenues. This exchange would be designed to cover the coffee-exporting country's grain import costs. Features of commodity swaps are

- They often extend a number of years ahead, much longer than most futures or options contracts.
- They are almost always intermediated by a bank which may "warehouse" part of the risk if, as is usually the case, the two arms of the swap are not of equal value. A number of international banks run a substantial commodity swap business and are able to introduce potential swap partners.
- Swaps are generally not marked to market and so give rise to default risk problem. In the case that the coffee price rises, the country which has swapped out its coffee risk has an incentive to default. Since governments or parastatals are the typical parties to a swap, swaps raise severe sovereign risk problems.
- Swaps can involve an element of optionality. Swaps with these features are referred to as "swaptions".

Swaps are widely used in metals but relatively little for agricultural commodities. In principle, there is no reason why swaps should not involve coffee, but since swaps are best suited to risk management over a period of years for organizations with substantial commodity revenues, governments are the only parties which would have any potential interest in these instruments.

2.3.6 Exchange *versus* OTC instruments

Hedging may be undertaken either using standardized futures and options contracts tradable on a recognized futures exchange, or an on OTC basis with a bank or a broker. The advantage of exchange instruments is that these positions can be closed out by an offsetting exchange trade. Furthermore, since the exchange quotes prices on a daily and even real time basis, it is straightforward to mark all positions to market, at least for book-keeping purposes. The disadvantages of exchange instruments is that they may not correspond very closely to the hedger's price exposure, giving rise to basis risk, and that marking to market on a daily basis may impose onerous margin cashflow requirements.

In contrast to the standardization of exchange instruments, OTC instruments may be designed to suit the requirements of each individual agent. This extends in particular to the payment and credit aspects of the instrument. More complicated instruments such as participatory collars are almost invariably traded on an OTC basis, although it would be possible to manufacture the cashflow pattern generated by a collar synthetically from exchange options. The second feature of OTC instruments that will often be valued, is the joint packaging of price risk management and credit features, which will limit margin finance requirements. However, both the non-standardization and credit features of OTC instruments will tend to make these expensive relative to corresponding exchange instruments. In particular, the

provider of OTC instruments will often assume a significant performance risk and will require compensation for this service.

2.3.7 Wholesale versus retail instruments – the role of local transmission mechanisms

The wholesale-retail distinction is well-known but has not been widely applied in the commodity risk management arena. Exchange instruments specify a standard lot size. This will not be problematic for large players such as roasters or exporters, but is likely to make the contracts inaccessible to small players such as farmers. If retail participants are to access risk management instruments, these must be provided on a micro basis. This can be done if a suitable intermediation agency can perform this function, purchasing the macro instruments from a normal wholesale provider and selling micro instruments in the retail market in a back-to-back manner. These channels are often referred to as "local transmission mechanisms" (LTMs).

Retail intermediation through LTMs has three costs.

a) The cost of retail distribution. This can be reduced if distribution is through an existing channel – eg through the national post office network or by a cooperative union to the primary cooperative societies.
b) The risk cost associated with any mismatch of the quantities purchased at the wholesale level and sold at the retail level.
c) Costs associated with non-performance by retail counterparties.

These retailing costs are likely to imply that instruments sold at the retail level will be significantly more expensive than those available at the wholesale level. Retail intermediation will only be justified if the benefits are commensurately large.

2.4 Matching instruments to purchasers and their objectives

The different actors in the coffee chain have differing risk management requirements and give rise to different problems as potential counterparties in any risk management transaction. It should therefore not be expected that the same instruments will be appropriate to all these actors.

2.4.1 Performance risk and the importance of constriction points

Performance risk arises whenever one or other party to a contract has an incentive to renege on the contract and the ability to do this. Any commodity contract which is not marked to market gives rise to the possibility of performance risk.

- In a fixed price forward contract, a price rise generates a loss to the long party and a profit to the short party. The long party therefore has an incentive to default. The opposite holds in the event of a fall in price.
- An OTC put option or price floor in which the premium is paid on a credit basis out of the commodity revenues will generate a default incentive in the event that the price is above the floor. At this point, there will be no benefit in exercising the option and therefore no cost in defaulting on the premium.
- Collars, including participatory collars, generate default incentives whenever the price outcome is such that the collar purchaser is obliged to make payments to the provider.

- Commodity swaps are equivalent to a pair of forward contracts, one in each direction. Each forward contract will give rise to profits and losses, and one or other party will have a default incentive.

The only means of eliminating default incentives is to mark all contracts to market. This has the effect of confining access to risk management to those agents who have sufficient credit to manage margin accounts and effectively excludes the majority of agents in coffee-producing agents from access. The alternative approach is to construct mechanisms in which

a) the extent of performance risk is kept low and
b) the costs of non-performance (default) are sufficiently high that this does take place frequently.

Default risk can be kept low by ensuring that the incentive to default is never high. One way of ensuring this is by spreading the cost of any instrument such that the incentive is capped at a reasonable level. Put options and price floors have this characteristic – the most that the purchaser is obliged to pay is the option premium. By contrast, collars load the premium payments into periods in which the price is high and thereby generate large payments in those periods. Although it is true that high coffee prices ensure the ability of collar purchasers to meet these payments, they also generate a significant incentive to renege. The same is true of fixed price forward contracts. This argument suggests that straight (vanilla) options will generally be more satisfactory than collars in environments in which default risk is a problem.

The second means of keeping default risk to a minimum is to ensure that the costs of non-performance are likely to be greater than the potential benefits. The penalty that can be imposed on a defaulter is to deny him the possibility of future business. This is the policy followed by commercial banks in relation to loan defaults and the same possibilities exist in relation to risk management defaults. The possibility of successfully imposing this type of penalty depends on the nature of the competitive process. If there is a large number of potential counterparties, the refusal by one of these to undertake further business will not impose any significant cost. By contrast, if the potential defaulter has little or no choice with respect to future counterparties, or if all potential counterparties act together against known defaulters, the costs of default may be high. This consideration focuses attention on so-called “points of constriction” in the marketing chain. These constriction points have the property that non-performance on a commodity contract gives rise to significant costs.

The constriction point concept applies directly to the issue of the choice among potential LTMs in relation to the retailing of commodity risk management instruments. We have noted (Section 2.3.7) that LTMs incur three sets of costs, one of which is the costs associated with non-performance. It is arguable that a successful LTM must enjoy the constriction property if intermediation costs are to be manageable.

2.4.2 Appropriate instruments for smallholders

In principle, farmers might make use of either futures or options-style instruments. In practice, three considerations indicate a very specific instrument choice.

a) Farmers are generally unwilling to sacrifice upside price potential. Rather, their concern is primarily to avoid very unfavourable outcomes in which they cannot meet essential cash expenditures.

b) The performance risk discussion (Section 2.4.1) suggests that instruments which generate large incentives to default should, where possible, be avoided.
c) Farmers are too small to directly access exchange futures and options markets. This is true of all but the largest farmers in the developed economies, and so will necessarily be the case in the African coffee-producing countries we consider, where farmers are smaller, have poorer credit, and where telecommunications are poorly developed.

The first consideration (a) indicates that OTC floor-style contracts are the natural risk management instruments to be intermediated to smallholder farmers. The second consideration (b) indicates that these should be paid for on a premium basis and not through a collar structure. The final consideration (c) requires that instruments be intermediated to farmers through a suitable LTM. The instrument best suited to the farmer's risk management problem is therefore a retail price floor. This is also the choice recommended by the International Task Force for Commodity Risk Management (the ITF).

The important questions in establishing a risk management intermediation scheme for smallholder coffee farmers are

- the cost of the instruments at the wholesale level,
- the choice of LTM,
- the costs of intermediation through the LTM,
- the willingness of farmers to cover the combined wholesale and intermediation costs,
- the justification, if any, of any public sector support for this provision, and the availability of that support.

2.4.3 Appropriate instruments for cooperatives and farmer associations

Cooperatives and farmers associations are potential LTMs in the intermediation of price risk management instruments to farmers, but they may also have risk management objectives in their own right.

Cooperatives and farmers associations have the potential to act as LTMs in intermediating price floors to coffee farmers for two important reasons

- Strong cooperatives or associations possess pre-existing low cost channels and mechanisms for reaching their farmer members.
- As membership organizations, they are able to concentrate social pressure to ensure that members perform on their contractual obligations.

It is also possible that they may qualify as constriction points in the coffee marketing chain. This is, for example, the case in Kenya where smallholders are obliged by law to sell their coffee through a cooperative, but is not the case in Tanzania or Uganda where cooperatives compete for coffee with private buyers.

An alternative possibility is for cooperatives or farmers associations to use accumulated funds to purchase price floors on behalf of their members. In this case, since no credit is advanced, there is no performance risk issue. In this competitive environment, a cooperative may see the offer of a price floor as a mechanism for attracting and rewarding its members.

We turn now to the cooperative as a candidate for risk management in its own right rather than on behalf of its members. The cooperative will have its own risk management objective if it has assumed exposure to the coffee price through the purchase of coffee from its members, as distinct from holding and marketing coffee on behalf of its members. In that case, the

cooperative will be in the same situation as any other coffee intermediary in that it will need to secure its margin. The ideal instrument for doing this is either a fixed price forward sale or a short futures position pending such a sale. Purchase of a floor partially obtains the same objective but imposes a cost in the form of the options premium. We discuss this issue in the following section in connection with local traders.

2.4.4 Appropriate instruments for local traders (traitants)

Local traders (traitants) buy coffee from farmers and sell to exporters. They carry price exposure during the intervening period. Their risk management problem is that of securing the margin on their trades. Ideally, they would do this by establishing a short futures position, and traders who act on either a direct or an agency basis for multinational exporting companies or roasters may obtain this service from their parent companies. Small local traders in Africa are unlikely to find this access possible.

As in the case of cooperatives, the purchase of price floors provides a partial substitute for futures positions. It may be simpler to provide this form of price insurance than outright futures cover since the cost, and therefore the potential default loss, is limited to the futures premium. As with cooperatives, direct purchase of a price floor does not raise any performance problem and if these instruments can be made available at the retail level, one would expect interested traitants to purchase this insurance. Provision on a credit basis presupposes the existence of a constriction point or a constriction mechanism. Possible constriction points are compulsory auctions, where these exist (Ethiopia, Kenya, Tanzania), or exporters associations which are prepared to act in unison against defaulters.

2.4.5 Appropriate instruments for exporters

In discussing the risk exposure of coffee exporters (Section 2.2.4), we have distinguished between the position of independent exporters and exporters which are either part of or work in an agency relation ship for multinational trading companies or roasters. The latter group already cope with coffee price risk through their parent companies and need not be of concern here. Independent exporters may or may not be able to access the same risk management instruments but are handicapped by poor communications, poorer access to credit and, in certain countries, restrictions on access to foreign exchange.

The risk management objective of independent exporters is to secure the margins between their purchase and sale prices. Often they are forced into back-to-back sales on a fixed price basis in order to eliminate their exposure as rapidly as possible, but this may oblige them to trade at less attractive prices than would otherwise be obtainable. In any case, they are often left warehousing residual risk. The ability to sell futures would improve their ability to compete. There is an argument that banks, brokers or even the exchanges themselves might have an interest in developing a hedging facility for independent exporters, but that lies outside the terms of reference of this study.

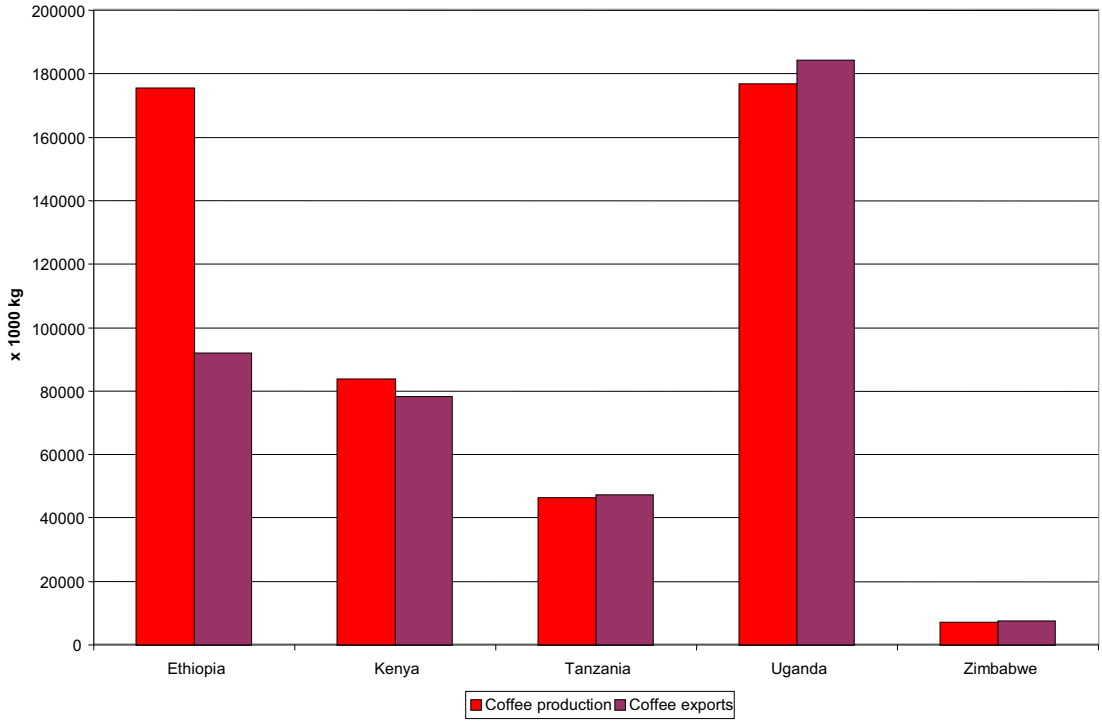
3 The Coffee Sector

3.1 Coffee on macro and micro level

3.1.1 Coffee in the national economies

In this Chapter we present an empirical description of the coffee sector in the countries under investigation. Figure 3.1 shows total production and exports in Ethiopia, Kenya, Tanzania, Uganda and Zimbabwe, averaged over the crop years 1991-2000. Ethiopia and Uganda have the largest production and exports. Coffee production and exports in Zimbabwe are much lower than in the other countries. Kenya and Tanzania are in the middle. Domestic roasting is not significant in any of the five countries except Ethiopia, where there is a strong coffee culture. Around half of Ethiopian coffee production is consumed domestically. In the four remaining countries almost all production is exported.

Figure 3.1 Total production and total export of coffee[7]



(annual average for the period 1991-2000)
Source: ICO

Coffee production in Ethiopia and Uganda in the period from 1991 to 2000 shows a clear upward trend of 6% to 9% annually. In Kenya and Tanzania the trend development in coffee production is moderate (2%-3.5%), while it is not possible to see clear evidence of a trend

[7] Uganda - and also, to a marginal extent, Tanzania & Zimbabwe - shows exports exceeding production. This is presumably caused by import and re-export from neighboring countries (Rwanda in the case of Uganda).

development Zimbabwe. Annual variability of production and export volumes is largest in Zimbabwe, medium in Ethiopia, Kenya and Uganda, and low in Tanzania[8].

Levels of production and exports may disguise the relative importance of a sector to the national economy in terms of its capacity to earn foreign exchange or to create employment or value added. The relative importance of coffee to the national economy may also influence the commitment and willingness of governments to support initiatives for the sector.

Coffee is the major export earner in Ethiopia with a (1995) export share of 65% This dependence on coffee revenues as a source of foreign exchange makes the Ethiopian economy vulnerable to low international coffee prices. Recent declines of Ethiopia's foreign exchange reserves - see Annex A2 - reflects to a large extent the decline in coffee prices combined with a high dependency of Ethiopia on coffee exports. The share of coffee in total exports is of the same order of magnitude in Uganda[9]. Uganda's reserve position has experienced continuous improvement over the period 1990-2001 despite the low coffee prices and the high dependency on coffee revenues - see Annex A2. This is consistent with the success of Uganda in diversifying towards other sources of foreign exchange earnings. Ethiopia and Uganda are, however, the only countries where coffee plays such an important role in terms of export earnings. Tea is the most important export earner in Kenya with an average share in the period 1995-1998 of 23% of foreign exchange earnings and coffee in second place with 14%. In Zimbabwe, tobacco has been the major export earner (29%, average of 1995- 1997), with iron ore in second place (9%) and sugar and cotton in third and fourth positions (both around 4.5%). Coffee in Zimbabwe has contributed only 1.5% to total export earnings. Export value data for Tanzania are also lacking, but own calculations indicate that the share of export earning from coffee is as high as 7%.[10]

The international coffee market has shown a secular decline in prices over at least the last fifty years, in line with the experience of most commodity markets - see CFC (2000), p. 34. This decline in prices reflects continuing productivity advance in commodity production and in particular in the coffee sector. Efforts to reduce the negative impact of falling prices on farmers include quality enhancement and niche activities such as Fair Trade, certified organic cultivation, etc. Plans and initiatives in the direction of quality improvement, Fair Trade and certified organic cultivation are currently being undertaken in many of the countries considered in this study.

Also market liberalizations implemented in the 1990s may have contributed to a mitigation of the reduction in revenues from coffee. A major impact of liberalization of the marketing chain will be increased competition and as a result lower prices for intermediaries such as traders and processors. We should therefore expect the share of the fob price obtained by farmers to increase after liberalization. Liberalization also tends to speed up marketing and payment.

[8] Zimbabwe: coefficient of variation (cv) of production is 42% and the cv of exports 34%, in Ethiopia, Kenya and Uganda cv of production: 18-22%; cv of exports: 22-29%; and in Tanzania cv. of production: 10%; cv. of exports 15%. Calculations are on the basis of annual data for the period 1991-2000

[9] Comparable data from UN Commodity Trade Statistics, SITC3 are lacking and hence these are processed data from other sources. We calculated an average share of 77% in the period 1991-1996 on the basis of ICO coffee export data evaluated at annual average prices paid to growers in US$ per kg, and related to IFS/IMF export data. The ICO country profile reports a share of 65%, coming down from 95-100% in the 1980s.

[10] Unavailable in UN Commodity Trade Statistics, SITC3.

In Figure 3.2 the real coffee price for growers in domestic currency is shown combined with the share that growers receive of the export price of coffee. The growers' share is calculated as the price paid to growers, divided by the monthly averages of ICO indicator prices, both in US$ cents/lb. In the case of robusta the latter pertains to the 'Average of Robustas Group (NY) and in the case of arabica the latter pertains to the 'Average of Other Milds Group (NY)'. Occasionally the share moves above 100%: this is caused by temporary price hikes in domestic markets (Kenya 1998, Uganda, 1999), and exchange rate devaluation that are not digested into correct coffee prices (Kenya 1994).

From the figures it is observed that there have been two peaks in prices during the 1990s, namely in 1994-1995 and in 1996-1997. The increase in the growers' share following liberalization in some countries (notably Uganda) could, however, not prevent a major decrease in revenue in recent years. Coffee farmers throughout east Africa are suffering from the currently low prices: In 2002 only a minority of coffee farmers in these countries is earning a reasonable income from coffee cultivation. Provision of price risk management instruments will not improve this situation: price risk management cannot affect the level of prices obtained (on average) by farmers, but only the predictability of prices.

Figure 3.2a Real growers' prices and growers share (Ethiopia)

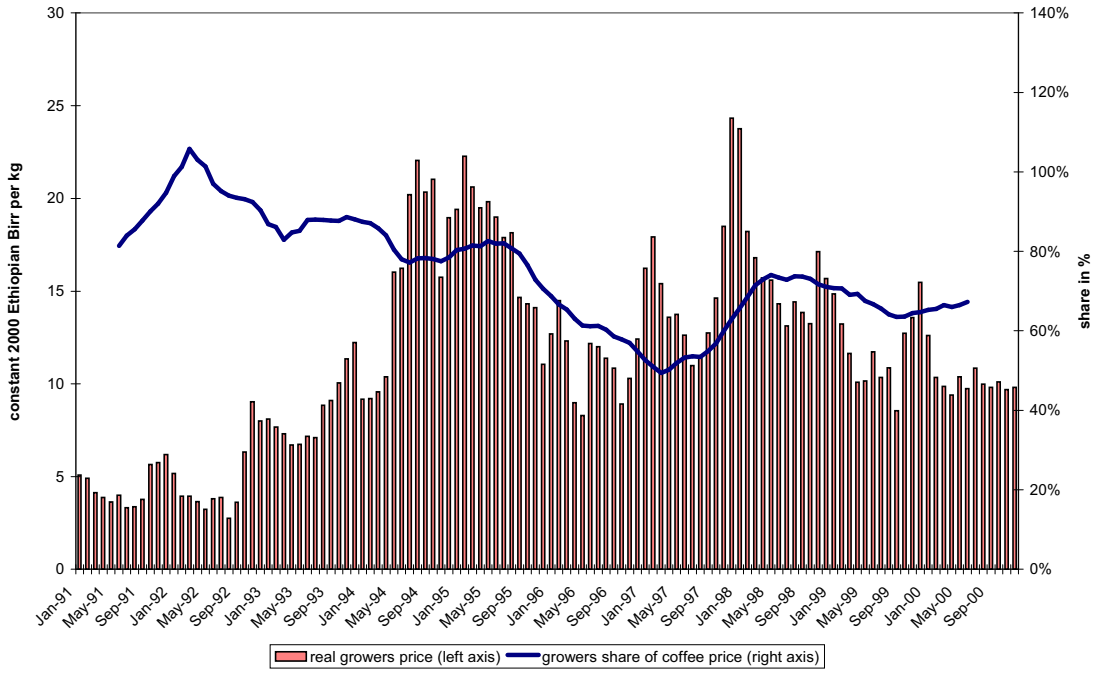


Figure 3.2b Real growers' prices and growers share (Kenya)

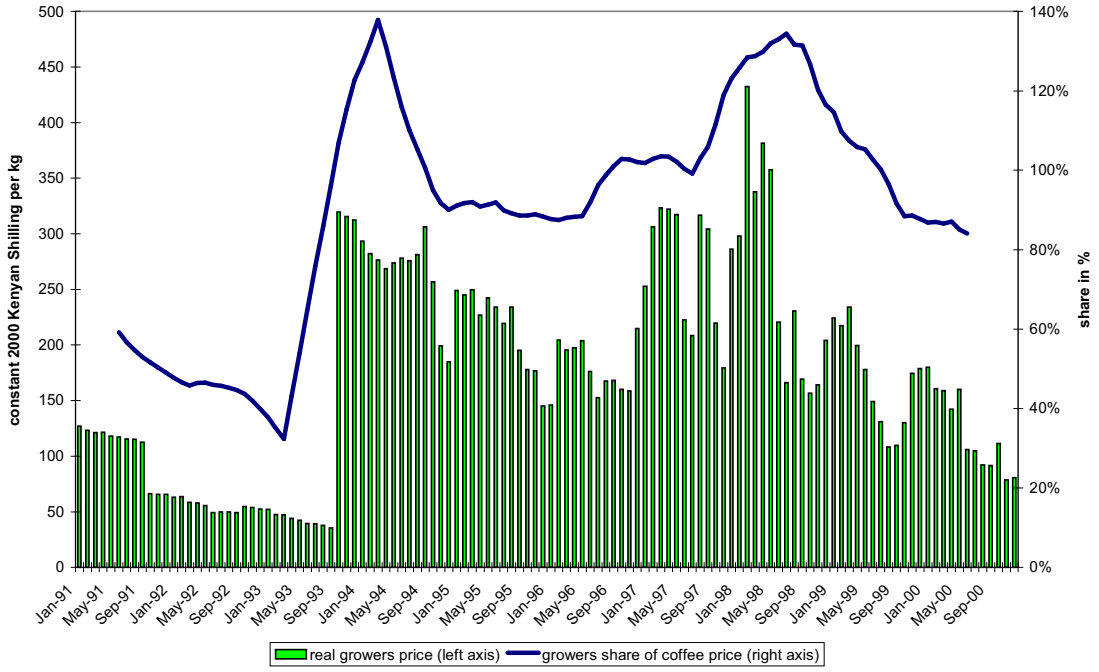


Figure 3.2c Real growers' prices and growers share (Tanzania)

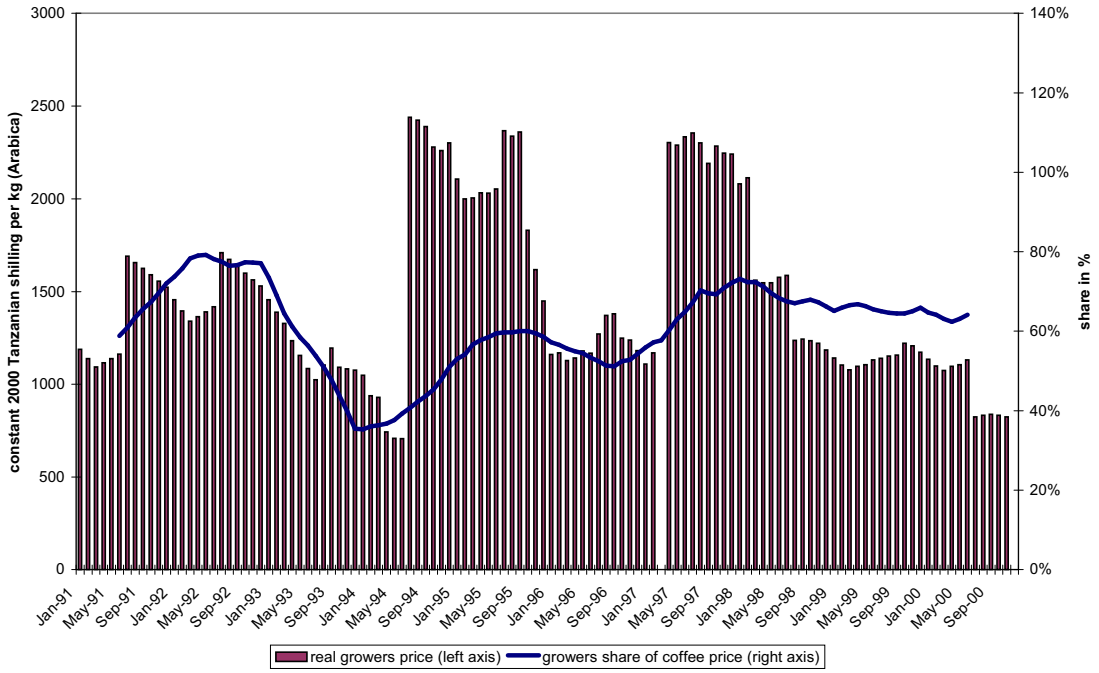
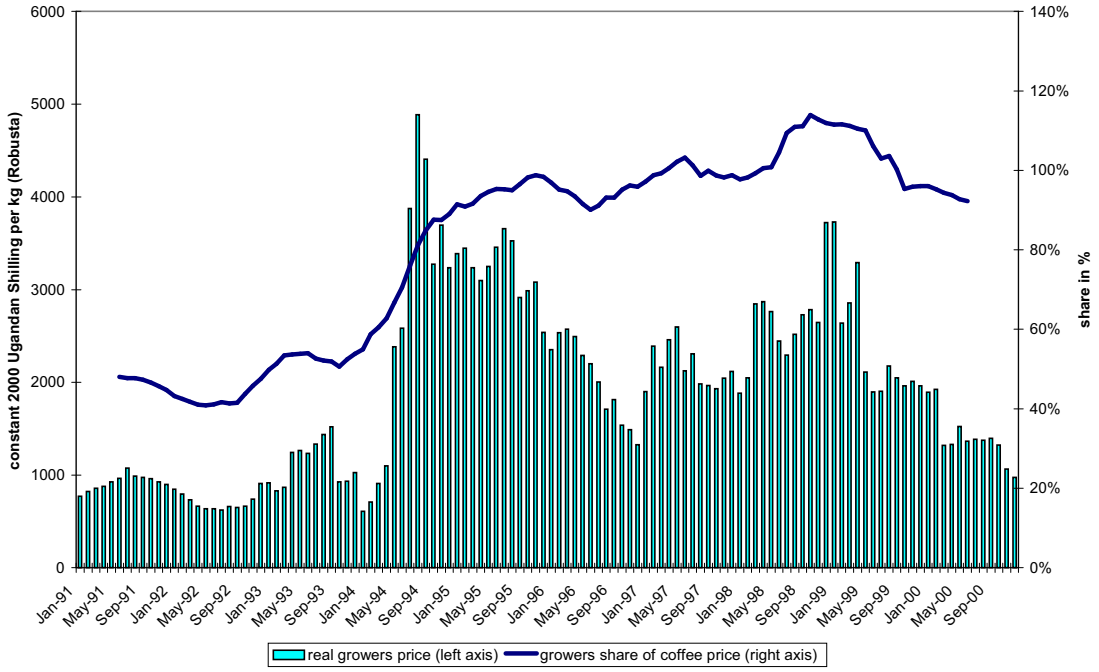


Figure 3.2d Real growers' prices and growers share (Uganda)



Price volatility to a large extent determines the risk of revenue fluctuations to farmers and hence the uncertainty associated with production decisions. Volatility of monthly growers prices of arabica and robusta, measured by the coefficient of variation, is presented in Figure 3.3a and 3.3b. Prices denominated in domestic currency (both nominal and real) as well as prices denominated in US dollars, are shown. It is observed that reported volatility of robustas is higher than arabicas, especially in Tanzania. The figures also show that real prices without exception have lower volatility than domestic nominal prices: this suggests that domestic inflation partially absorbs commodity price shocks. Price volatility in Zimbabwe is very high compared to the other countries: only volatility of robustas in Tanzania approaches Zimbabwean volatility. Ethiopian data on (nominal) auction prices reveal that the volatility of washed arabica is higher than that of the unwashed arabica (coefficients of variation 0.33 and 0.19, respectively).

Figure 3.3a Volatility of monthly prices paid to growers (arabica)

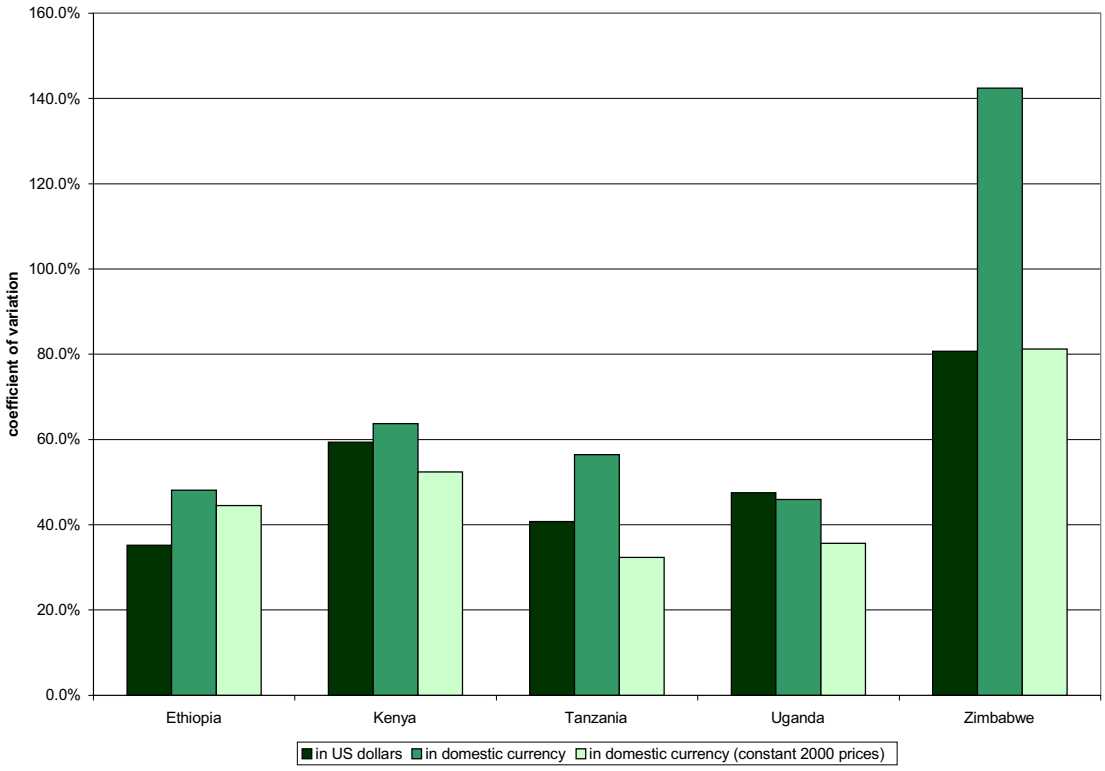
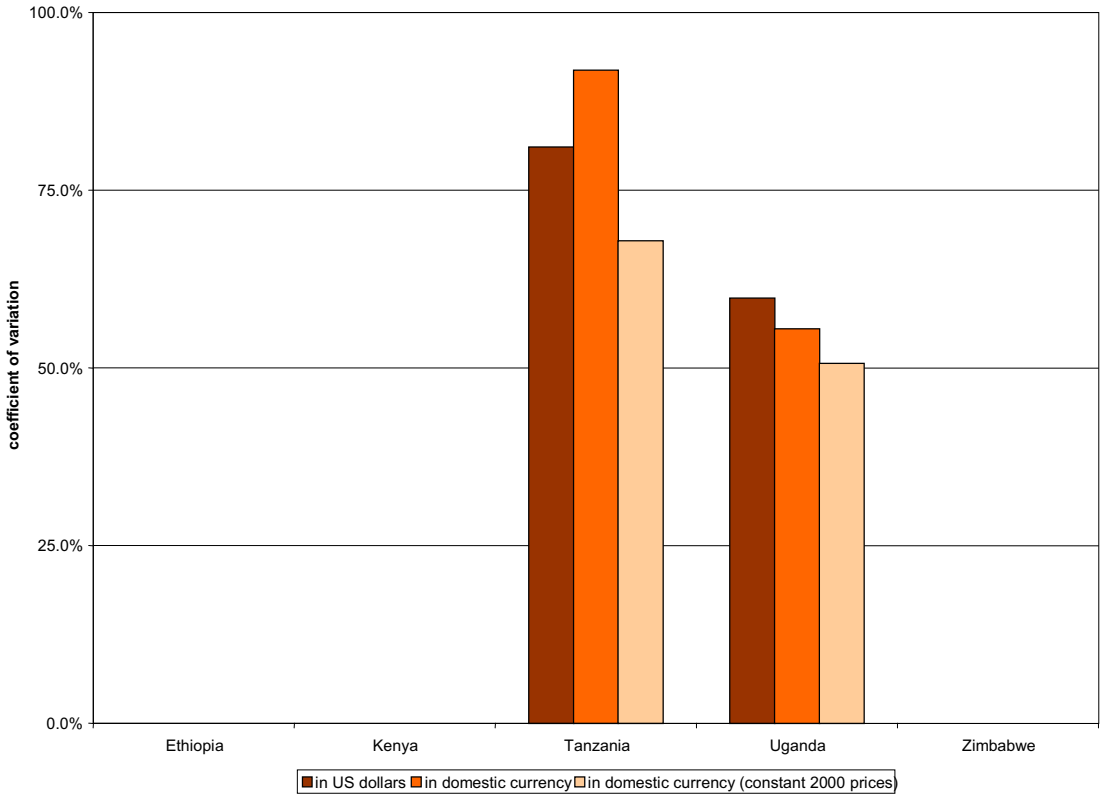


Figure 3.3b Volatility of monthly prices paid to growers (robusta)



Source: ICO, IFS/IMF

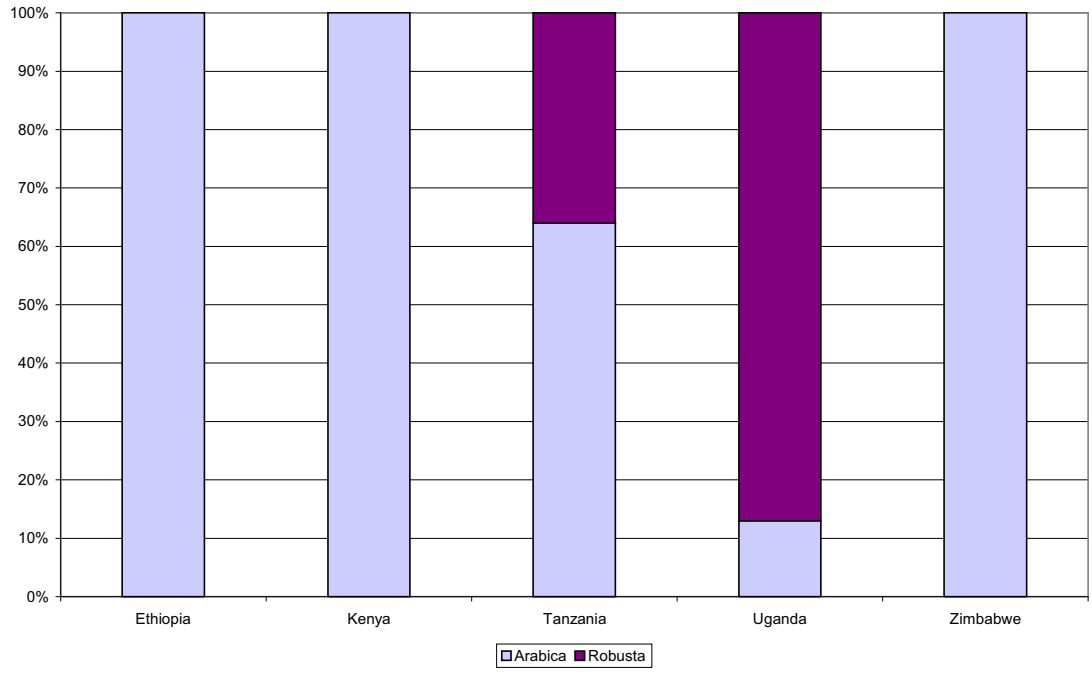
Calculations for a limited number of observations on annual aggregate production show that volatility of production is at most half as high as volatility in prices. From an aggregate perspective this indicates that priority should be afforded to price risk management rather than crop risk management. Aggregate figures nevertheless fail to represent the crop risks at the farm level. Evidence on production of a number of individual Kenyan cooperatives over the period 1995-2001 indicates that volatility of production is close to price volatility. These data also reveal that volatility of sales (in value terms: price times quantity) are substantially higher which suggests that price peaks are not fully compensated by production troughs or vice versa.

3.1.2 Coffee cultivation

Coffee is a tree crop. There are two main botanical species, arabica and robusta. Arabica is grown at altitudes over 1000m, is native to Ethiopia and produces superior quality beans that have good aromatic properties. The robusta species can grow at a lower altitude, are native to Uganda, have higher yields and are more resistant to pests and diseases. Despite these agronomic advantages, the taste of robusta coffee is regarded as inferior to arabica, although washed robusta is highly regarded in some consuming countries in particular for its low acid contents.

The information on the distribution of botanical species in coffee production is summarised in Figure 3.4. Ethiopia, Kenya and Zimbabwe only produce arabica. Uganda and Tanzania produce both, but Uganda mainly robusta, and Tanzania mainly arabica. The analysis in this study focuses on robusta in Uganda and on arabica in all remaining countries, in line with the importance of these varieties in the countries in question.

Figure 3.4 Coffee production: botanical species

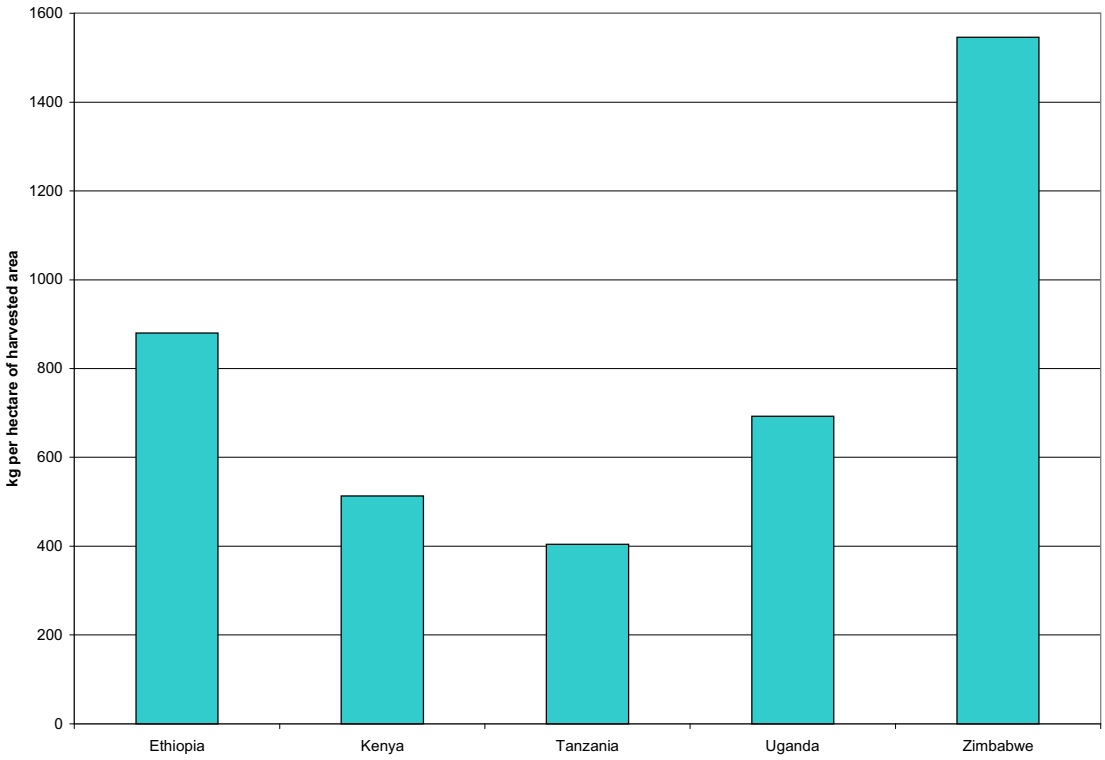


Coffee cultivation is usually not evenly spread throughout the country, but rather concentrated to a region or a number of regions. In Ethiopia the production of coffee is concentrated in the

southern regions and in the Oromiya regions. In Tanzania arabica is grown in the north (Kilimanjaro: Arusha, Tanga, Morogoro) and south (Ruvuma, Iringa, Mbeya and Rukwa), and robusta in north-west, close to Lake Victoria (Kagera, Kigoma, Mwanza). In Uganda, robusta is grown in the south along the border of Lake Victoria, in the southwest along the borders with Tanzania, Rwanda and Zaire, up to Lake Albert, while most arabica is grown in Bugisu on the slopes of Mount Elgon, with smaller quantities in Mbarara, Kasese, Bunibugyo and West-Nile (Okoro). In Kenya more than 50% of total coffee production (only arabica) originates from the region around Nairobi in the Central Province, in particular the districts Kiambu, Murang'a , Nyeri and Kiringa. In Zimbabwe, coffee production is located around Chipinge and Mutare near the Mozambique border.

Arabica coffee invariably commands a premium over robusta: in Tanzania and Uganda arabica growers prices in the period 1991-2000 are 166% and 71% higher than robusta prices. However, this premium needs to be offset by the difference in yields for the two varieties and the difference in production costs per unit of coffee produced. A cost-of-production study on the basis of 1994-1995 data for Uganda coffee growers shows that the per kg margin for arabica growers is only a little higher than that of robusta farmers (49% against 43% of farm gate price; see ICO, 1997).

Figure 3.5 Yields in coffee cultivation (annual average for the period 1990-2001)



Source: FAO

The possibility of increasing yield is crucial in setting the incentives for farmers to raise sufficient funds to buy inputs. Yields in coffee cultivation show large differences among smallholders, among estates, between smallholders and estates, between regions and between

countries. However, country data shown in Figure 3.5 reveal that average yields in coffee cultivation are highest in Zimbabwe (close to 1600 kg per hectare of harvested area). These high yields reflect high input use (see Annex A2). Second highest average yields are realised in Ethiopia (slightly above 800 kg per hectare harvested area).[11] The remaining countries have lower average yields: Kenya around 500 kg per ha, Tanzania around 400kg per ha. and Uganda around 700 kg per ha. Kenyan average yields are not particularly high in view of the relatively high input use and mechanisation of agriculture (see Annex A2).

The availability of extension services may also be an important determinant of yield in coffee cultivation in particular because government funded extension services have been reduced in the course of liberalization in the early 1990s. This may also explain the lower yield level in Kenya. The type of information provided by extension services may also differ depending on whether the service is commodity-specific or general (see CFC 2000). In the latter case extension services for cash crops like coffee have to compete with extension services for food crops and these tend to get a higher priority. However, commodity specific extension is not a guarantee for high quality services: until 1991 extension in Ethiopia was carried out by the Ministry of Coffee and Tea Development, but the service was poor and constrained by the conflict then prevailing in the country.

3.1.3 Smallholders and estates

Coffee is grown in various ways, also depending on the country. In **Ethiopia** there are four types of production system: forest, semi-forest, garden and estate. Forest coffee is grown coffee under the full coverage of natural forest trees and accounts for 10% of Ethiopia's coffee production. In semi-forest cultivation (35% of Ethiopia's coffee production) farmers acquire forestland and thin and select forest trees to ensure both adequate sunlight and proper shade for coffee trees. Garden cultivation pertains to cultivation in low densities inter cropped with other crops and usually fertilised with organic wastes. Finally, plantations or estates attached to well-managed farms, formerly state owned (5% of Ethiopia's coffee production) but also a number of private farms (15% of Ethiopia's coffee production) with state of the art cultivation practices (use of recommended seedlings; proper spacing, mulching, weeding, shade regulation, manuring and pruning). In Ethiopia smallholder producers are responsible for 95% of production.

In **Kenya** the bulk of all coffee farmers - 99% and around 600,000 in number - are smallholders with an average area of 0.5 hectare and producing around 57% of Kenya's coffee production. The remaining part – the estate sector - pertains to 380 large coffee farms (average size 85 hectare) and 1300 small estates (less than 20 hectare). Most larger estates are well organised agricultural firms using hired labour and fertiliser and other material inputs, as opposed to smallholders where labour is usually family labour and negligible inputs are used. A study among coffee smallholders in the Central Province indicate that these coffee farmers are well diversified: 68% of all smallholders have coffee revenues constituting less than 50% in their total household income and 34% of all smallholders have coffee revenues constituting less than 10% of their total household income. Only 18% of the smallholders report to have coffee revenues that account for more than 90% of their total household income (Karanja, 2002).

[11] Other sources report smallholder yields ranging from 500-600kg per hectare in Ethiopia (see ICO/CFC, 2000)

In **Tanzania** small-scale farmers, owning less than 2ha per household, produce about 80% of total coffee in Tanzania. Most of the smallholder farmers intercrop coffee with bananas. The main zones practising this system (Kagera and Kilimanjaro-Arusha) account for about 70% of cultivated coffee. In the southern coffee areas (Ruvuma and Mbeya) inter-cropping with other food and cash crops like maize is also practised. Generally regions where coffee is grown are also important for cultivation of basic foods, and there is competition between coffee and these food crops. Coffee is predominantly grown to provide cash income.

In **Uganda** a total of 500,000 smallholders cultivate coffee on fairly small holdings, with an average plot size of 0.23 hectares, and are responsible for most of the coffee production (see ICO, 1997). Most coffee plots are inter-cropped with other crops, mainly bananas, beans and groundnuts. Coffee cultivation in Uganda takes place using a low input – low output technology. Due to subsistence farming, reliance on family labour, modest use of purchased inputs, advanced farming techniques and irrigation, Uganda is a low cost producer with per unit production cost that are less than 85% of Vietnam production costs. Most coffee farmers in Uganda are very small and poor, and lack funds to afford the equipment for wet processing: hence most coffee is dry processed.

Coffee production in **Zimbabwe** is relatively recent and dates from the mid nineteen sixties. It was pioneered by commercial farmers, many of whom were new immigrants to the country (then the British colony of Southern Rhodesia) from other colonial or ex-colonial countries or from Europe. There are now around 160 commercial farmers located around Mutare and Chipinge near the Mozambique border. Production is almost entirely a mild washed arabica. There was no tradition of smallholder coffee farming which has grown in a haphazard way as the result of a lack of supportive institutional structures. One significant pocket of smallholder production, on the slopes of Mount Selinda on the Mozambique border near Chipinge, grew out of a failed Commonwealth Development Corporation (CDC) dairy project on the basis of Stabex payments.

Table 3.1 summarizes the most important features of the type of production. In Table 3.2 the harvesting periods in the various countries are indicated. The coffee season stretches over a period of 6-9 months.

Table 3.1 Coffee production: smallholders and estates

	Ethiopia	Kenya	Tanzania	Uganda	Zimbabwe
smallholders' share in %					
production of coffee	95	54-65	80	100	5
number		99		100	92
area	96	75-76	95	100	
average size (in ha.)	0.5	0.5	(<2)	0.23	
average size of estates (in ha)		30			
families dependent on coffee (x1000)	800		400		
people dependent on coffee (in mlns.)	15			2.5	

various sources

Table 3.2 Coffee production: harvesting period

	Ethiopia	Kenya	Tanzania	Uganda	Zimbabwe
main harvest arabica	Oct/Apr	Oct.-Dec.	Oct./Dec.	Sept./Dec.	July/Oct.
secondary harvest arabica		June & Aug.			
(main) harvest robusta			June-Dec.	year round, peak in May-June	

source: ICO

3.1.4 The coffee commodity chain

Once the coffee berries on the trees turn red, the farmers must collect the cherries within a few days and start the so-called primary processing (sorting, cleaning, drying, hulling, washing or pulping and drying), since otherwise the cherries spoil. The picking season usually extends over a few months. The harvest of cherries should be transported almost directly to either a pulpery or coffee washing station or they should be processed on the farm.

Two (primary) processing techniques are practised: the dry method and the wet method. The **dry method**[12] (also called the natural method) is the oldest, simplest technique for doing the primary processing and requires little machinery. The method involves drying the whole cherry. There are variations on how the process may be carried out, depending on the size of the plantation, the facilities available and the final quality desired. The three basic steps, cleaning, drying and hulling, are described below. Firstly, the harvested cherries are usually sorted and cleaned, to separate the unripe, overripe and damaged cherries and to remove dirt and other rubbish. The ripe cherries may be separated by flotation in washing channels close to the drying areas. The coffee cherries are spread out in the sun, either on large concrete or brick patios or on matting raised to waist height on trestles. As the cherries dry, they are raked or turned by hand to ensure even drying. It may take up to four weeks before the cherries are dried to the optimum 12% moisture content, depending on the weather conditions. On larger plantations, machine-drying is sometimes used to speed up the process after the coffee has been pre-dried in the sun for a few days. The dried cherries are stored in bulk in special silos until they are sent to the mill where hulling, sorting, grading and bagging take place (see below).

The **wet method** requires the use of specific equipment and substantial quantities of water. As in the dry method, preliminary sorting and cleaning of the cherries is usually necessary to remove partially dried and unripe cherries, stones and dirt. After sorting and cleaning, the pulp is removed from the cherry. The pulping is done by a machine which squeezes the cherries between fixed and moving surfaces. The flesh and the skin of the fruit are left on one side and the beans, enclosed in their mucilaginous parchment covering, on the other. The pulped beans go on to vibrating screens which separate them from any unpulped or imperfectly pulped cherries, as well as from any large pieces of pulp that might have passed through with them. From the screens, the separated pulped beans then pass through water-washing channels where a further flotation separation takes place before they are sent to the next stage. Because the pulping is done by mechanical means it normally leaves some residual flesh as well as the sticky mucilage adhering to the parchment surrounding the beans. This has to be completely

[12] The material on dry and wet method of processing coffee is taken from the ICO web site.

removed to avoid contamination of the coffee beans by products resulting from the degradation of the mucilage.

The newly pulped beans are placed in large fermentation tanks in which the mucilage is broken down until it is dispersible, when it can be washed away. For most coffees mucilage removal takes between 24 and 36 hours. When the fermentation is complete, the coffee is thoroughly washed with clean water. The wet parchment coffee at this stage consists of approximately 57% moisture. To reduce the moisture to an optimum 12% or less, the parchment coffee is dried either in the sun, in a mechanical dryer, or by a combination of the two. The sun-drying is done on extensive flat concrete or brick areas, known as patios, or on tables made of fine-mesh wire netting. The beans are laid out in a layer of 2 to 10 cm, and turned frequently to ensure even drying. Sun-drying should take from 8 to 10 days, depending upon ambient temperature and humidity. Coffee dries more quickly if raised on tables because of the upward draught of warm air. The use of hot-air drying machines becomes necessary to speed up the process in large plantations where, at the peak of the harvesting period, there might be much more coffee than can be effectively dried on the terraces. After drying, the wet-processed coffee, or parchment coffee as it is commonly known, is stored and remains in this form until shortly before export.

Removing the pulp from the cherry is the key difference between the dry and the wet method, since in the wet method the pulp of the fruit is separated from the beans **before** the drying stage, while this is done **after** drying in the dry method. When properly done, the wet method ensures that the qualities of the coffee beans are better preserved, producing a green coffee that is homogeneous and has few defective beans. Hence, the coffee produced by this method is usually regarded as being of better quality and commands higher prices. Washed coffee earns a premium and hence washing is the preferred processing technique.

The dry method is used for almost all robustas. However, both in Uganda and in Tanzania, there are reports of investment in processing facilities for washed robusta coffee. Wet processing for robusta coffee has been encouraged in Uganda since the end of the 1990s (see ICO, 1997). The wet method is generally used for all the arabica coffees, and rarely for robusta coffees. However, the dry method is used for most of the arabica coffee produced in Ethiopia, which is due to the lack of washing capacity and lack of funding for installing the washing stations. Especially cooperatives in Ethiopia run washing stations (see also below). Dry processing is not practical in very rainy regions, where the humidity of the atmosphere is too high or where it rains frequently during harvesting. Use of the dry and the wet method, together with the installed capacity for washing and milling is summarised in Table 3.3.

Table 3.3 Coffee processing: method of preparation and processing capacity

	Ethiopia	Kenya	Tanzania[2)]	Uganda	Zimbabwe
method of preparation [1)]	dry (80-85%) wet (15-20%)	wet	wet	dry (most) wet (little)	wet
number of mills		5	12-15		11
total annual milling capacity (x1000 tonnes)		230			40

source: [1)] ICO; [2)] TCB web site

The final stages of preparation of the coffee, known as 'curing', usually take place at a special plant just before the coffee is sold for export. The coffee is hulled, to remove the parchment, or in case of the dry method, to remove all the outer layers of the dried cherry in one step, then passes through a number of cleaning, screening, sorting and grading operations which are common to both wet- and dry-processed coffee. Electronic sorting machines may be used to remove defective beans, including those known as 'stinkers', which cannot be distinguished by eye.

3.2 Cooperatives and farmers' associations

3.2.1 Cooperative sector: history and development

In this section we give a short overview of the major developments in the cooperative sector in the 1990s. Prior to liberalization in **Ethiopia** (before 1992/93) there were two types of cooperatives, so called producer cooperative and so-called service cooperatives. Producer cooperatives marketed their production collectively, while service cooperatives were involved in various activities like processing and marketing coffee, providing inputs, crop finance and distribution of basic goods. During the military regime the cooperative sector was financially supported and the regime encouraged the formation of both types of cooperatives. Since liberalization the funding of the cooperative sector has stopped and cooperatives are treated on the same footing as other corporate entities. Producer cooperatives have disappeared, as well as the central cooperative organization and currently only service cooperatives remain.

As an integrated part of the reform process in the 1990s, coffee producer cooperatives in **Kenya** have experienced considerable institutional change. The government removed previously tight controls over the cooperative sector in 1998 when the new Cooperative Act has become effective, maintaining some regulatory control on the cooperative sector but at the same time encouraging cooperatives to go commercial and stand on their own feet (Karanja, 2002)[13]. Nevertheless, in a very important respect the cooperative sector in Kenya remains not fully liberalized: growers in Kenya are obliged to be members of a cooperative unless their coffee acreage exceeds two hectares, in which case they may establish a primary processing unit themselves. Under the revised law – to become effective in April 2002 - the obligation on small farmers to sell through cooperatives will be maintained, primarily for reasons of quality control, with the notable difference that this requirement will now apply to all farmers with less than four hectares of coffee[14].

Experience elsewhere in Africa suggests cooperatives can seldom compete effectively with the private sector. There is a number of reasons for this and in certain cases it is possible that protection shields inefficiency. **Kenyan** cooperatives have a protected position due to their strong legal base. Cooperative management is often elected and it is not always clear that electoral success is correlated with financial or management skills. Since coffee farmers are forced to make use of services of cooperatives and lack alternatives for delivering coffee, the cooperative management gets inappropriate incentives from their members. This may lead to

[13] Due to these reforms the farmers have been given powers to decide on the management of the cooperatives. This resulted, amongst other things, in a splitting up of existing cooperatives in smaller units, increasing the total number of cooperatives from 207 in 1990 to 335 in 1999.

[14] It is asserted that only poorly managed smallholders are in this group, as the efficiently run and well- organised smallholdings have been able to expand to an acreage larger than four hectares (see Karanja, 2002).

efficiencies and little cost effectiveness on the cooperatives' side. As a result the performance of these cooperative societies in processing and marketing coffee diverges widely and this entails a risk to coffee farmers. Poorly organised cooperative societies also pass on poor incentives to farmers. Against this, it is arguable that a strong cooperative structure is required to ensure continued access to quality and other premia.

Prior to 1976, cooperative unions in **Tanzania** were member-based organizations. They were commercially run and succeeded both in borrowing from commercial banks and in repaying their loans. The strong position of the cooperative sector during this period is also acknowledged by commercial banks. In 1976, the government dissolved the unions and replaced them by crop authorities and, at the village level, village authorities. This led to a sharp deterioration of the coffee sector in the period to 1981-82 with the result that the government decided to re-establish the cooperatives. This took place in 1984, but the unions were now government-sponsored rather than member-based and tended to have heavy structures. The current legal framework of cooperatives dates back to the 1991 Cooperatives Act. This act allowed members to reassume control. Previously, there were tertiary coffee apexes – above the cooperative societies and cooperative unions - but these have been scrapped on the basis that they did not serve any useful purpose. At the fourth level there was an overall national level apex. The recent move is therefore from three to two tiers. Unions sell coffee at the auction, but primary societies may also do this, and it is arguable that many unions are inefficient in this and other respects. However, the primary societies require assistance and preparation if they are to undertake their own marketing.

Prior to liberalization of the coffee sector in **Uganda**, cooperatives depended on government finance. Both cooperatives and the marketing board were efficient in the monopolistic conditions prevailing at that time. The number of distinct stages in the cooperative chain made them high cost. They had become very large and rigid and typically held dominant positions in their sectors. Liberalization in Uganda started in 1991. High margins allowed cooperatives to survive for a period in the liberalised market, but competition brought these margins down and the marketing board and most cooperative unions did not survive. Effectively, almost the entire cooperative sector in the coffee collapsed in the mid-1990s. After the collapse of the cooperative sector, associations started to establish with more or less comparable objectives, but structured in different and more flexible ways.

Cooperative societies are not significantly involved in the coffee sector in **Zimbabwe**. However, Zimbabwe Coffee Mill (ZCM), which is a non-profit farmer-owned company, carries out some of the functions normally associated with cooperative societies (see section 3.2.3).

3.2.2 Cooperatives: operation and structure

In **Ethiopia** the only still existing type of cooperative, the service cooperative (as opposed to the production cooperative that does not exist anymore) is subject to the same rules as corporate entities. Membership of service cooperatives is voluntary to coffee growers. Many service cooperatives run washing factories and storage facilities. Service cooperatives mainly purchase cherries from the farmers, wash them, and transport the processed coffee to the auction. Service cooperatives compete with private traders (akrabies) and the Ethiopian Coffee Purchase and Sales Enterprise (ECPSE): coffee growers can choose between delivering to akrabies or to cooperatives. Quality premiums only flow to farmers if they deliver to cooperatives. There are

currently 3,000 to 4,000 cooperatives, each comprising 3 to 4 farmers associations and around 1,500-2,500 smallholders. The share of coffee from service cooperatives brought to the auction has shown a decreasing trend in the 1990s and is currently well below 10% of all deliveries. However, the service cooperatives have a substantial share in washed coffee.

Box 1: The Oromia Coffee Farmers Cooperative Union

In Ethiopia we interviewed staff of the Oromia Coffee Farmers Cooperative Union (OCFCU). OCFCU is one of the few cooperatives thathas reported to export directly outside the auction. The OCFCU supplies export organic coffee that fetches a higher price (20-30 cents premium) and are contracted by a Dutch buyer, who helped them earn the certificate on a cost share basis, in return for delivery of coffee. The Dutch importer offers a fixed price, announced each year in November, and, hence, there is no exposure to price risk, apart from the exchange rate risk. OCFCU also sells small quantities of coffee to the Fair Trade Organization at profitable prices. The OCFCU combines 38 cooperatives from 8 different provinces, with together some 25,000 smallholders farmer members, with a total production of around 17,000 tons annually. The primary objective is to export specialty coffee. The farmers are paid the auction price without discounts, plus 70% of the profit on export of the coffee. Their export capacity is in the order of 2000 tons, and they want to expand this by establishing more pulping stations.

Cooperative societies or farmers cooperatives in **Kenya** are involved in primary processing (pulping, washing, drying), provision of inputs and storage. In fact, the cooperative societies remain the main channel through which smallholder farmers undertake primary processing of their coffee cherries.

Primary cooperative societies in **Tanzania** deal directly with farmers. Each primary cooperative society has an average of 1000 members. In the past, the law required that all coffee farmers belong to a cooperative in order to sell their production, but the 1991 Cooperative Act has made membership voluntary. Farmers are, hence, free to sell their cherries directly exporters. Unions operate at the secondary level – typically there are around a maximum of 100 primary societies in a union. Currently there are six unions and around 300 primary societies. Kilimanjaro National Cooperative Union (KNCU) is a relatively well-organised union and is regarded as financially strong although it also has suffered from two years of low prices. KNCU comprises 93 primary cooperative societies. The CRMG of the World Bank has done a proposal for price risk management in Tanzania that makes use of KNCU as a local transmission mechanism (for further details on KNCU see ITF, 2001).

All (primary) processing used to be in hands of cooperatives, but many cooperatives have found it difficult to compete successfully with private buyers. Currently, cooperatives are mainly involved in marketing and, in some cases, the supply of inputs. In addition to these services and benefits, some cooperatives and farmers associations offer their members transport and marketing services and training with regard to quality improvement. Such services are important because they enable the farmers to capture potential quality premiums. We visited a primary cooperative society near Babati (Mlimani Cooperative Society), that has apparently converted into a producer association. The management of the association stated that they do

offer these services. We were informed that only three cooperative unions are still involved in marketing – Kilimanjaro, Mbocu (in the south) and Kagera (in the robusta producing area in western Tanzania).

Primary cooperative societies in **Uganda** do still exist although membership is no longer compulsory. There are 44 active primary societies, with a membership of approximately 11,000 farmers. For the most part these cooperatives do not participate in marketing, with the exception of Bugisu Cooperative Union. This union, however, operates in an arabica-producing area and benefits from a fair trade arrangement. Overall, cooperatives in Uganda now have well below 20% of the market, but may be recovering share. Those cooperatives that have survived in the current market are said to be reasonably robust. In particular, they compete reasonably effectively with the multinationals and have some fair trade business. Cooperatives are currently in the process of being reorganised into regional associations. This should enable them to bulk allowing exploitation of economies of scale. Cooperatives are stronger in the arabica areas than in the robusta areas.

Box 2: The Kibinge Coffee Farmers' Association

We visited the Kibinge Coffee Farmers' Association, a group that also features in the ITF proposal for Uganda (see ITF, 2002). Associations are an alternative to cooperatives. They are loose voluntary groups varying in size from 10-100 farmers, who choose their own rules. Associations tend to concentrate on extension and some in credit and as yet have not moved into marketing. The associations are funded through contributions of participants and participation is voluntary. Financial Service Associations (FSAs) form an important group of associations. They offer their participants saving and credit services. All members have to deposit a certain amount and are, subsequently allowed to take a credit of 3 times that amount. FSAs have accounts at banks, particularly at the Development Finance Corporation of Uganda (DFCU).

There are a number of key differences between cooperatives and associations. Cooperatives have been created under Government Act, their structure and organization is super imposed by the government, and they operate under statutes. In the past, cooperatives are said to have suffered from poor management, largely due to appointing managers on the basis of electoral results rather then on the basis of managerial skills, and it is possible that this remains true of some of the surviving cooperatives at the present time. As opposed to cooperatives, participation in associations is voluntary and the organizational structure of associations varies widely. The associations are also said to suffer from poor management because the management is on average young and not experienced. Management of associations, however, is believed to improve in the future as rules and regulation in associations are less restrictive.

3.2.3 Financial position and involvement of commercial banks

In general, financing needs of cooperatives involve funding purchases of inputs to be distributed among members, for funding expenses for primary processing, most notably salaries of staff, but also other inputs, and possibly funding for hiring of temporary labour for picking cherries (harvesting).

In **Ethiopia** Branches of Commercial Bank appear to be actively and closely involved in the business strategy and operational plans of service cooperatives (prices to coffee growers, savings, etc.). The Commercial Bank has a network of 170 branches of which 70% in rural areas and provides mainly short-term credit to service cooperatives rather than to farmers directly. There is little evidence of crop-finance for coffee growers directly. The short-term credit provided by Commercial Bank to service cooperatives are intended for purchasing coffee from farmers, and subsequent washing and hulling.

The banking sector in **Ethiopia** was liberalised in the early 1990s and by 1994/95 private commercial banks started operations, but these newly established banks have little business in the coffee sector. International banks are not allowed to operate in Ethiopia: establishment of international banks would demand at a minimum further liberalization of foreign exchange regulation. The three major banks in Ethiopia – all former government banks – are: Commercial Bank, Development Bank and Mortgage Bank. Development Bank and especially Commercial Bank are traditionally most relevant to the coffee sector. Collateral requirements, loan guarantees and paperwork are a restrictive factor, particularly at the Development Bank.

In **Kenya** cooperatives are statutorily in a position to maintain reserves, and might in principle save to accumulate reserves for low income periods. Most cooperatives have an account at and borrow from the Cooperative Bank of Kenya to finance their activities. Cooperatives are free to choose another bank but in practice always choose the Cooperative Bank, because of the attractive conditions for borrowing. The Cooperative Bank allows cooperatives to lend 40% of turnover and accepts tangibles (including property), hypothecation of stocks and irrevocable instructions as collateral[15].

In 2001-2002, many cooperatives in **Kenya** suffer from increasing debt burdens due to low prices and slowly adjusting operating costs[16]. Overall the cooperative sector is adversely affected by the low prices. Many coffee farmers - both smallholders and estates – are reported to lose currently on production due to the costs imposed on them after delivery to the mills and the auction, combined with the decreasing revenues from sales. Recent seasons have also been associated with a higher incidence of crop failure than previously. As a result estates and cooperatives also have obtained less revenue from coffee production & processing than they anticipated and those banks from whom they borrowed have been obliged to restructure their debts. In recent years, 4-5% of coffee loans of the Cooperative Bank of Kenya have been rolled over.

Collateral requirements for getting loans are usually fairly restrictive for smallholders: credit and loans are mainly allowed on the basis of land titles as collateral. Hence, alternative forms of collateral appear highly desirable. One such form of such collateral is applied by Kenya Planters' Cooperative Union (KPCU): KPCU allows credit on the basis of stocks of coffee stored in their warehouses. The time between the need for credit for funding inputs and the selling of coffee at the auction is long. There is some scope for rotation of crop loans (the crop in this season provides the collateral for the crop finance of the next season).

[15] Around 50% of lending by the Cooperative Bank is to the agricultural sector. All Kenyan banks have a statutory obligation to lend 17% of their funds to the agricultural sector. Other banks do much less than this (perhaps 5%), but the Central Bank does not attempt to impose this requirement.

[16] There exist cooperatives that are cost effective. Improvement may be achieved if farmers are given more responsibilities and if for example input credit is taken up on a farmers basis instead of a cooperative basis.

Few commercial banks in **Tanzania** have significant business in the coffee sector. Banks (including CoopRDB, the renamed Cooperative Rural Development Bank[17]) are particularly reluctant to take on business with cooperatives. This attitude of commercial banks towards cooperatives appears to be the result of:

- Their lack of collateral and other repayment guarantees,
- The poor financial performance of cooperatives, especially in the recent years (2001, 2002) when coffee prices have been very low,
- Poor financial and management skills in the organization of the cooperatives
- Farmers may sell their coffee to private traders, and this makes recovery from the cooperatives difficult
- Problems with hypothecation of auction proceeds.

In **Uganda** cooperatives and farmers' associations are financially weak. Uganda has developed a very efficient coffee sector in the years since liberalization and it is not clear that cooperatives serve any useful function in this system. In this respect it should be noted that the processing and marketing of robusta coffee - the main Ugandan crop - is substantially simpler than that of arabica, which forms the bulk of Kenyan and Tanzanian production. As a result there is little value added in processing robusta and little comparative advantage for cooperatives in providing processing services. These functions can easily be undertaken and possibly more efficient by other firms, without hurting the interests of farmers.

Farmers require access to credit and, in the absence of efficient cooperatives or farmers' associations, this may be best supplied directly to farmers on a microcredit basis. In Uganda, Centenary Rural Development Bank (CRDB) successfully operates a credit scheme for the maize and bean sectors. In 2000-01, 15% of CRDB's loans were to smallholders, although not in the coffee sector. Repayment of these loans is tailored to the cash flow of the crop. CRDB is prepared to finance from planting, through harvesting to marketing. Various alternative forms of collateral are accepted (bicycles, cows, furniture etc). CRDB's loan business to these maize farmers out-performed the bank's other lending activities and there were very few defaults. However, there was some deterioration in 2000-01 due to the collapse of the Ugandan maize price. The success of this credit scheme is attributed to the accurate screening and selecting of potential debtors. Screening of candidate borrowers is out-sourced to a specialised agency, the Agribusiness Development Centre (ADC) which is responsible for technical assistance in the field. Both CRDB and ADC stated to us that they would in principle be happy to consider cooperation on a coffee risk management project.

Banks have traditionally provided finance, including long term finance, to the large commercial coffee farmers in **Zimbabwe**. This provision was substantially reduced following the losses resulting from the cyclone in 2000, and has almost entirely disappeared as the result of the land resettlement policy. Only one local bank, Kingdom Bank, remains active as a lender to the sector. Kingdom Bank lends to some commercial farmers, and also, via Zimbabwe Coffee Mill (ZCM), to smallholders. This ZCM facility, which is backed by ZCM assets as collateral, provides pre-shipment finance to smallholders enabling ZCM to pay these farmers a basic price

[17] CoopRDB reported itself to be "not very comfortable" with their lending business to cooperatives. Three years ago, CoopRDB wanted to put a number of cooperatives into liquidation, but the government intervened to prevent this. However, the government is no longer able to guarantee the cooperatives – the Central Bank now prohibits such actions.

on delivery: Once the coffee is marketed a bonus is paid. In this respect, ZCM, which is constituted as a not-for-profit company, functions along the same lines as a cooperative.

3.2.4 Future perspectives and new developments

In **Ethiopia** service cooperatives are encouraged to export directly to foreign buyers. This is part of a new arrangement that allows to by-pass the compulsory auction. In general, it is believed that cooperatives could get a higher price better by providing direct export facilities and bypassing the auction. Farmers may benefit more from cooperatives in this way.

In **Kenya** a contraction of the marketing chain is envisaged under the new Act by by-passing commission agents who currently handle the coffee sold at auction. There appears to be some scope for even further contraction of the marketing chain in coffee. For example the cooperative sector could be trimmed by by-passing the unions and perhaps also cooperative societies, and by establishing the current primary processing factories as independently operating units. In general chain shortening is desirable in order to make the industry more transparent, to cut costs and increase transaction and payment efficiency.

Comparable developments are taking place in **Tanzania.** A recent policy document based on the results of a presidential commission addressing shortcomings in the operation and financing of cooperatives, suggested that there is some justification for the existence of primary cooperative societies, but that the remaining structure could be simplified (see Komba et al., 2001). The government regards cooperatives as having an important continuing role in marketing and would prefer to see them strengthened. However, the government may be compromised in this regard by its continuing commitment to the unions in terms of political education. Ministries on the other hand take a more practical stand in the debate on the future of the cooperative sector.

The Tanzanian Coffee Board reportedly favours a move away from the cooperative union structure to greater reliance on voluntary farmers' groups. These farmers' groups are considered to have a better future: they become stronger and officials may be trained to handle credit and other transactions. Primary cooperative societies may also convert to farmer associations, as has the Mlimani Cooperative Society. Some banks (notably EXIM Bank) are assisting this restructuring. Nevertheless, these farmers' groups are too small to act as free-standing LTMs in a price risk management scheme. Farmers' groups in Tanzania also do not appear to be willing to pay for price insurance on an outright basis, with the notable exception of the KNCU. Instead, their main concern was for access to finance to cover harvesting and marketing expenses.

In **Uganda** nucleus farms are an important new development. These farms with a planned size of around 100-150 ha, would also provide services like inputs and credit to a surrounding smallholder network. The Uganda Coffee Development Association (UCDA) is attempting to develop this concept. If nucleus farms become a major feature development in the coffee sector in Uganda, they would be candidates as potential risk management LTMs.

It seems likely that the structure of the Zimbabwean coffee sector may change markedly in the coming months. **Zimbabwe** has embarked on a land resettlement scheme which has the objective of transferring commercial farms, almost entirely run by farmers of European descent, to African smallholders. Official government policy is that resettlement would not apply at this stage to plantations where it is recognized that a more gradual transition is necessary if export

revenues are to be preserved. Despite the fact that this remains official policy, around 90% of commercial coffee estates have recently been issued with so-called Section 8 notices which requires their owners to stop farming with immediate effect and to vacate their land by 10th August 2002. The Commercial Farmers' Union, which represents these farmers, is recommending that they should continue to farm while they await developments. Our view is that it seems likely that a substantial change in ownership and hence structure will take place in the sector over the current season.

The land resettlement process creates uncertainty and is fraught with danger for the coffee sector.

- The large commercial farms have central processing facilities for washing and processing. Many have nurseries, important in Zimbabwe because of the very short (seven year) production cycle. A small number also have milling and bagging facilities. If these farms are to be divided into smallholdings, it will be imperative that these maintain a formal association (perhaps on the basis of a cooperative or farmers' association) in order to fund and maintain these facilities. Failure to do this will jeopardize yields and quality, and will raise processing costs.
- The yields obtained in the Zimbabwean coffee sector rely on intensive application of lime and fertilizer. The small number of smallholders currently producing coffee have been provided with these inputs through Stabex funding. It will be important that the existing Stabex funding is extended (difficult in view of its limited size and commitments already made) or that appropriate credit facilities are in place to ensure that new smallholders are to maintain these levels of input application,
- There must be a danger that new smallholders will lack the knowledge and experience to continue and maintain the current very sophisticated (fast cycle, irrigation-intensive) mode of production. A rapid ownership transition will require a very substantial education and extension activities. It is not apparent that the resources are available for this effort.

The problems inherent in a rapid transition in ownership are such that both the yield and quality of Zimbabwean production will suffer, possibly dramatically, unless this is very carefully managed. This conclusion is underlined by evidence that many current smallholders are producing low quality coffee suggesting that existing smallholder support systems are inadequate. Our view is that the official government policy of a more gradual ownership transition, possibly based on nuclear farms supporting outlying smallholder producers, is both a less dangerous and more reliable means of achieving the objective of a more balanced ownership structure without jeopardizing the very considerable achievements and potential of the sector.

3.2.5 Secondary processing of coffee: structure and development of milling

A key position in the coffee sector in **Kenya** is taken by a particular cooperative, the Kenya Planters' Cooperative Union (KPCU). KPCU started in 1937 mainly as a bulk purchasing agency for settler coffee farmers. It later moved into processing and built its own mill. KPCU is regulated under the Companies Ordinance of 1933 as a Limited Liability Company and also under the Cooperatives Society Ordinance, but is exempted from the provisions of the latter. Both the smallholder coffee growers' cooperative societies and estates constitute membership of KPCU Ltd. with equal voting rights at official meetings. Currently KPCU's key activity is the

milling of coffee. Their milling capacity is 240,000 ton per year of which usually only half is used. To feed their Nairobi processing factory, KPCU transports coffee from up country production areas. KPCU also advances short term finance to farmers and cooperatives, mainly for the purchase of inputs and it has some extension activities.
KPCU has a network of branches (eleven main branches) and collection points throughout the coffee area to buy coffee from cooperatives. Inputs are also distributed through these branches and collection points. Three KPCU branches also have milling facilities. Most coffee, however, is transported through KPCU channels to the KPCU mill in Nairobi where it is further processed and handed over to the Coffee Board of Kenya (CBK) for marketing. About 70% to 80% of all coffee in Kenya is milled through KPCU.[18] The remainder is processed by international companies. Due to its commercial transactions with coffee cooperatives, KPCU maintains extensive accounting records of cooperatives activities.

Up to 1993 Tanganyika Coffee Curing Co. Ltd. (TCCC), based in Moshi, held a monopoly in curing coffee in **Tanzania**. After liberalization of curing, private curing factories started operations. In 2002 a total of 15 curing factories exist, mainly as sister companies of exporting companies. TCCC is said to have competitive milling rates relative to other Tanzanian mills. Utilization is currently very low reflecting excess milling capacity and the post-liberalization decline in the cooperative sector: installed capacity is 50,000 ton per year, in the past years only 8,000 tons (2000/2001), 10,000 tons (1999/2000) and 4,000 ton (1998/1999) has been milled. TCCC hulls and grades parchment coffee and prepares it for auction. Cooperatives or farmers who deliver their parchment maintain ownership of the coffee and different lots of the different sellers are kept separate. Farmers receive a receipt at delivery of parchment. Typically, processing requires three weeks from delivery to the auction, but this may be longer at busy times. The owner is paid seven to ten days after the auction, so the whole process takes around four to five weeks. After auctioning exporters keep purchased lots on average three weeks in store.

Prior to 1993, processing in **Zimbabwe** was a monopoly of the Grain Marketing Board (GMB), which operated as a traditional parastatal. Following liberalization of the sector in 1993, the farmer-owned Zimbabwe Coffee Mill (ZCM) was set up. ZCM has a modern facility in Mutare which provides easy rail access to the Indian Ocean at Beira. Currently around 60%-70% of Zimbabwean production is processed by ZCM. This includes almost the majority of smallholder production, including some from farms on the Mozambique side of the border. A share of 15% of the ZCM equity is owned on or on behalf of smallholder farmers. Around ten of the largest commercial farms undertake their own processing and some smallholders deliver their cherries to these farms for primary processing. In addition, a small amount of coffee is exported as parchment to South Africa and is processed there.

[18] 71.5% in 1997/1998; 74.4% in 1998/1999; 74.9% in 1999/2000.

3.3 Coffee marketing

3.3.1 Organization

Coffee smallholders in **Ethiopia** sell a small portion in red cherry form to service cooperatives and private suppliers (akrabies), where the cherries are washed. However, cherries are mainly sold in dry form to - also mainly - private collectors (sebsabies) and some to the Ethiopian Coffee Purchase and Sales Enterprise (ECPSE). The private collectors (sebsabies) sell the larger part of this dry coffee to private suppliers (akrabies). Both ECPSE and akrabies do the hulling of the dried coffee and deliver their coffee subsequently at the auction. In general mostly *akrabies* bring their coffee merchandise to the auction for sale and exporters buy at the auction. Lower qualities (reject coffee) are for domestic consumption. The large share of domestic consumption may help to push prices at the auction occasionally above world market prices. However, a large part of domestic consumption is either 'unofficial' trade or own consumption by the grower, and does not effect the auction directly.

The compulsory auction in **Ethiopia**, conducted by the Coffee and Tea Authority (CTA), has been maintained. We were informed that service cooperatives are allowed to by pass the auction and export themselves directly. The auction is located next to the Coffee Processing and Warehouse Enterprise (CPWE). There is now actually a separate auction of Harar coffee in Dire Dawa: currently this auction accounts for 20% of marketed coffee and the remainder is marketed in Addis Ababa. Coffee is auctioned by the lorry-load, with the lorry physically present outside the auction. In general lots comprises some 120-150 bags. The lots that are offered for sale are displayed around the auction hall: number and name of the seller, and the characteristics of his or her supply, quality, moisture, character etc., including the results of cupping (taste). Cup tasting is done centrally by the Coffee and Tea Authority and exporters do not get the opportunity to cup the lots on offer themselves (as opposed to NCE and MCA where exporters get the opportunity to do their own cup tasting, see also below). The actual auction takes place daily (twice a day during the peak season) and the auctioning is done by open outcry. Payment of lots should take place within 48 hours after auction.

As mentioned above, around 70% to 80% of all coffee in **Kenya** is milled through KPCU: most coffee is transported through KPCU channels to the KPCU mill in Nairobi where it is further processed and handed over to the Coffee Board of Kenya (CBK) for auctioning. After April 2002 when the new Coffee Act becomes operative KPCU will also be involved in marketing (and take over the role of CBK in this respect). International companies have a market share of 15% to 20% of the milling.

By law all coffee in **Kenya** is marketed by auction through the Nairobi Coffee Exchange (NCE). Prior to 2002, the NCE was operated by the Coffee Board of Kenya (CBK) but under new legislation CBK becomes the industry regulator and the NCE has been transferred to the KPCU which is responsible for marketing. The transition has been successful in terms of the operation of the auction but CBK, which had borrowed against future auction receipts, is currently suffering significant financing problems in meeting payments to farmers due on the June 2002 auctions just prior to the transfer.

Only cooperatives and estates can deliver to Nairobi Coffee Exchange (NCE). Auctions take place once a week on Tuesdays. The NCE is an automated electronic auction and is conducted on the so-called English system. During an auction prices, displayed on an electronic screen

located at the head of the trading floor, first tick down until a bid is made, and then they rise as long as there is competitive bidding, given effect by a dealer depressing a button on the desk in front of him. A lot is sold if there is no further bid during a five second interval. Lots are grouped for auction by grade, with lower specification grades auctioned first and higher grades towards the close of the auction. The most common grade is AB and this amounts, on average, to around 50% of all turnover. On request exporters are supplied with pre-auction samples in order to be able to make their own classifications of the lots at auction (cup tasting).

At the end of 1992 the Coffee Board of Kenya (CBK) was mandated to conduct the Nairobi coffee auction in US dollars. Since that time, there has also been a relaxation of the previous prohibition on farmers receiving payment in US dollars and farmers may now retain these dollars for own use. By allowing trade to be denominated in US dollars farmers stand to benefit from favourable exchange rate movements. This shift to a dollar basis for trade should be seen in the light of the overvaluation of the Kenyan Shilling prior to 1992. Access to foreign exchange has improved access to cheaper dollar credit. Smallholders who market their coffee through cooperatives have not been able to benefit to the same extent from these changes (Karanja (2001)).

In **Tanzania** all coffee is required to pass through the Moshi Coffee Auction (MCA), which is organised by the Tanzania Coffee Board. This, however, does not imply that all coffee is transported physically to Moshi: coffee produced in remote areas is put in storage locally, and only samples and further details of these lots are send to Moshi. The auction currently uses an open outcry system but a move to an electronic auction has been agreed. The auctioneer usually starts with the prices of the lot previously auctioned. The Tanzanian Coffee Board (TCB) is financed by a 1% levy on proceeds of Moshi Coffee Auction.

In **Zimbabwe**, coffee marketing is carried out by ZCM and also by those large farms with their own processing facilities. Most coffee if exported to Europe but Japan and South Africa are also destinations. ZCM supplies buyers with samples who then make offers for the coffee. A proportion of coffee (historically around 30% but higher in the current year) is sold forward on a differential basis to traditional customers. Forwards sales allow ZCM to lock into favourable prices and facilitate borrowing.

3.3.2 How are farmers paid?

In **Ethiopia** farmers are paid directly in cash by the private collectors and domestic traders (sebsabies and akrabies), on delivery of coffee.

The system of payment for coffee deliveries in **Kenya** shifted from pooled payment to direct payment in 1992. In the pooled system coffee payments were pooled together by CBK, who made a number of interim payments to farmers based on the (expected) average price of the season. The final payment was made only after the accounts for the year were settled. In the direct payments system farmers are paid the amount that is realised at the Nairobi Coffee Exchange, less statutory deductions. In past years (2000-2002), 80% of payments have been made through the direct system and 20% through the pooled system. The main advantages of the direct system are, that farmers are paid much more quickly compared to the payment under the pooled system, and farmers who deliver good quality coffee that fetches high premiums receive the auction price rather than the annual average price. Both from a finance perspective as well as from an incentive perspective direct payment appears superior.

The financing of the sales of coffee from primary cooperative societies, farmers' associations or farmers in **Tanzania**, is organised a number of varying ways:

- A cooperative union (e.g. KNCU) arranges for bank finance in advance of delivery to TCCC using its own collateral. The bank's agents visit TCCC to ensure that the delivery has indeed taken place. Unions also offer this collateral facility to primary cooperative societies by borrowing from banks and distributing these funds to primary societies.
- TCCC issues warehouse receipts as collateral. TCCC monitors the inventory for a bank and Tanzanian Coffee Board pays the bank directly. This can work for small primary societies or farmer groups. However, some banks want a formalised collateral management arrangement. The Warehouse Receipt Scheme of the CFC may fill this gap.
- Farmers-groups bring their coffee to the auction and simply wait for the proceeds from the auction. This procedure is simple but has the disadvantage of delayed payments and the lack of any possibility for borrowing to anticipate these payments

In **Zimbabwe**, commercial farmers receive payments once coffee is delivered. Smallholders are paid a basic price on delivery of their beans to ZCM through the Kingdom Bank pre-shipment finance facility (see section 3.2.3).

3.3.3 Price discovery, auction issues and future plans

In **Ethiopia** the auction systems functions reasonably well. To some extent, price discovery is distorted by off-auction deals, resulting in traders actually bidding on coffee they already owned. In the recent past, some irregularities have been uncovered, such as exporters buying with uncovered cheques, and sellers who managed to bribe some auction officers to change the numbers of the lots that were sold. Since February 2001 compulsory auction-accounts for exporters have been introduced to prevent further non-payment. This implies that exporters are required to keep an auction account from which their bids are paid. Government licensing aims, amongst other things, at separating functions in the marketing chain. This objective is, however, not achieved, as these licenses are now easily available at low prices (around 200 Birr). This limits their role as potential contract enforcement instrument: threatening to withdraw the license is not so serious since it is apparently possible to obtain a new one cheaply. The additional requirements for bidders in the auctions had also to do with the wide availability of these licenses. Exporters report to be in favour of auction-accounts, as this helps against sellers-buyers collusion that push prices above market levels. Exporters also report to regret the cheap licensing because cheap licenses provoke abuse. On the other hand, a wide availability of licensed buyers prevents cartels.

The Nairobi Coffee Exchange (NCE) in **Kenya** functions well. It is supported by exporters as it guarantees the quality of the product, it offers the opportunity to cup taste the coffee that is going to be auctioned, and it offers storage facilities. In the past, the warehouse facilities offered by CBK were not always good. Prices at the Nairobi Coffee Exchange follow prices at the New York Board of Trade (NYBOT), and many exporters hedge their purchases at NCE through NYBOT. There are no legal constraints to such transactions. Prior to transfer of the auction to KPCU, CBK would have liked to see the Nairobi auction system extended to the whole of east Africa, encompassing Tanzania and Burundi (both arabica producers). This would be facilitated by an opening of the borders, and perhaps eventually, by the re-creation of a common East

African currency. Robusta coffee produced in the Western Province of Kenya may already be freely sold in Uganda. It is unclear whether KPCU embraces these ambitions.

The two main problems of the functioning of the Moshi Coffee Auction in **Tanzania** have been the transactions of integrated firms on the auction which tend to distort the price discovery, and the funding of Tanzanian Coffee Board (TCB) through the auction. The post-liberalization period has seen many coffee-trading firms integrated their processing and exporting activities. The consequence is that these firms found themselves obliged to repossess their coffee at the compulsory Moshi auction. There was a danger that this may undermine the price discovery mechanism. The share of these repossessed coffee in total volume of coffee auctioned varied from auction to auction, and from year to year but could be as high as 72% (see Temu et al., 2000)[19]. A 2002 decision will force a segregation of firms between buying, processing and exporting starting in the 2002-03 campaign. This decision eliminates the repossession problem at the Moshi auction but prevents firms from realizing the benefits, if these exist, from vertical integration. It may raise intermediation costs.

The TCB receives a percentage fee of the auction value and hence TCB has an interest in higher prices. The auctioneer contributes to this by actively participating in the auction. Exporters may therefore find themselves bidding against the auctioneer. It was also suggested to us that those exporters who repossess their coffee at the auction will pay a sufficient price to ensure that the 1% levy payable to the TCB is at an acceptable level. It is suggested that this leads to the accounting prices for repossessed coffee typically exceeding competitive levels.

In **Uganda** there is an initiative to start up an arabica coffee auction with the main purpose to provide an alternative marketing channel for farmers and thereby improving price discovery. It is intended that the shareholders of the auction will be farmers and traders. The planned arabica auction will be one part of a planned commodity exchange on which up to eight commodities may be traded. Implementation is planned for the end of 2002.

In **Zimbabwe**, there is an awareness that the current system whereby ZCM markets to a small number of traditional buyers may fail to maximize the available premium. ZCM has expressed interest in marketing either through a regional southern African association (which would include coffee from Malawi, South Africa and Zambia) or, more conjecturally, linking to the Nairobi Coffee Auction.

3.3.4 Export

In most African coffee exporting countries two types of private exporters may be distinguished: first, there are those private exporters who operate on a stand-alone basis, and second those private exporters who operate on behalf of a international roasting or trading company. Agents of international companies have easy access to credit and to expert knowledge on trade finance and risk management techniques. These agents can easily and at low costs hedge their positions on international futures market. Exporters who operate on a stand-alone basis, may also hedge but at greater cost. As a result a larger part of the business of these smaller exporters is on a back to back basis, or even uncovered.

Ethiopia is the exception to this rule: in Ethiopia international roasting companies are prohibited from buying coffee at the auction (see also ICO/CFC, 2000). Ethiopia's coffee

[19] The share of deliveries to the auction that is brought by licensed exporters (so-called captive supply) is in 1993/94: 0%; in 1994/95: 11%; in 1995/96: 42%; in 1996/97: 72% and in 1997/98: 53%.

exporting marketing structure consists of one public coffee export enterprise – the Ethiopian Coffee Export Enterprise (ECEE, 25% of the export market) and more than 130 Ethiopian private coffee exporters (75% of the export market). The role of these exporters is to buy coffee from the auction centres and then to process and export it to overseas markets, once the coffee has met the required standard. Exporters are also not allowed to hedge on NYBOT.

Kenya shifted to US dollar denomination of its internal coffee trade at the end of 1992 when the Coffee Board of Kenya was mandated to conduct the Nairobi Coffee Auction in US dollars. Both types of exporters - exporters with and without foreign parent companies – buy coffee at NCE. There are no legal constraints for Kenyan exporters hedge their purchases at the auction on the New York coffee exchange (NYBOT).

Until 2002-03, private exporters in **Tanzania** could buy coffee directly from farmers on the condition that the coffee was subsequently presented for sale at Moshi Coffee Auction. For this reason many exporters maintained a network of regional and local agents. A buyer will require around 200 buying stations to ensure full national coverage. The buyer will purchase parchment arabica or FAQ (Fair Average Quality) robusta. Prices for parchment coffee are publicly advertised at buying stations and prices of different exporters' agents tend to converge. At the Moshi Coffee Auction, independent exporters compete for 'free' coffee (i.e. not re-possessed). To the extent that they anticipate that this may be difficult, they will need to secure coffee by up-country purchases. As noted in section 3.3.3, new legislation forces functional segregation from the 2002-03 campaign with the implication that exporters will no longer be able to buy directly from farmers or to process their own coffee.

Most Tanzanian export transactions are conducted in US dollars. Exchange rate risk is an important factor for private exporters. In principal, there are no formal or regulatory constraints in Tanzania to hedging in overseas markets. Larger private exporters are mainly agents of international companies (roasters, international trading firms) and these exporters hedge their purchases through their parent companies. Domestic traders either do not have easy access to these hedging facilities or regard hedging as too expensive. They confine themselves to less sophisticated risk management techniques, in particular use of back-to-back transactions. It was stated to us that the decline in coffee prices over the past three years has bankrupted a number of exporters.

In **Uganda** liberalization of the economy started in 1991 and currently the coffee industry is fully liberalised. Marketing in the **Ugandan** coffee chain is efficient and transparent – it is fast, and supports large volumes on small cash flows. Most farmers sell hulled cherries directly to the exporter or his agent. However, some (often small) farmers sell cherries to the huller who acts as an intermediary. A few exporters are also involved in secondary processing.[20] Most exports of Ugandan coffee are undertaken by privately owned exporters. The share of domestic exporting companies decreased from close to 100% in 1991/92 to around 50% in 1999/2000[21].

The larger exporters who are part of or are associated with international companies routinely hedge their positions on the LIFFE coffee futures market. Some of the independent exporters

[20] Coffee should contain a maximum of 15% moisture content but exporters will purchase beans with 16-17% moisture content and dry the beans themselves.

[21] This development reflects on the one hand bankruptcies of pre-liberalization export companies (mainly the Coffee Marketing Board (CMB)), and on the other hand the penetration and expansion of international roasting companies into the Uganda coffee export business (for an exhaustive overview of turn-over by exporter, see Annex 5 in ITF, 2002).

also do this, although possibly at greater cost. Contractual prices are set at a differential to the relevant futures price. Other independent exporters, typically the smaller exporters, prefer to sell on a fixed price basis. They do not hedge, and in principle do not need to do so, but they experience problems in maintaining a square position and sometimes find themselves assuming uncovered positions. Transport is by transit companies with SGS (Société Générale de Surveillance SA) verification on behalf of customers.

The export of coffee from **Zimbabwe** has been discussed in section 3.3.1.

3.3.5 Quality issues

Although quality is not the primary concern of this study, it is important to be aware of any risk management scheme in coffee quality. This is for two reasons:

- As in all commodity trades, quality is a contentious issue.
- Quality enhancement is a major method for increasing the origin's share of retail coffee prices.

Quality issues arise most acutely for arabicas than robustas. High quality arabicas can sell at substantial premia to terminal market prices and can be highly rewarding to the farmer. Kenya has been particularly successful in earning these premia, while quality premia in Ethiopia and Tanzania, each of which also has excellent potential for high quality production, have been both less good, and, in Tanzania, have declined over time. Zimbabwe has earned a consistent but not enormous quality premium.

Those exporters in **Tanzania** who buy directly from farmers do not pay premia for high quality parchment coffee. This is the consequence of the inability of buyers to discriminate between high and low quality beans prior to curing. Buyers aggregate smallholders' coffee into larger parcels, which prevents individual smallholders establishing a reputation for high quality beans. Buyers will pay on the basis of average quality, but since an average payment gives little incentive to farmers to invest effort in quality enhancement, quality declines to a basic level. Only well-organised farmer associations or cooperatives and larger farmers can escape this vicious circle, either by selling directly at auction or by establishing a reputation for high quality.

The Tanzanian Coffee Board (TCB) is also concerned to improve the auction system in such a way that strengthened farmers associations can bring their coffee to the auction. We had the opportunity to visit the Mlimani Rural Cooperative Society at Babati, currently the only cooperative or producer association, that brings their own parchment coffee to the curing factory of TCCC and subsequently to the auction.

Robusta differentials are more consistent over time and reflect the general reliability of the origin, average proportions of defective beans and humidity. **Uganda** obtains a consistently high premium on the basis of a favourable reputation on all three of these counts. During the initial stages of liberalization, when new exporters enter the market, quality control and strong regulation by UCDA succeeded in preserving good quality through quality certification. The UCDA certificates were regarded as genuine guarantees of quality in international trade. At that time, the Coffee Marketing Board remained responsible for a large proportion of Ugandan coffee processing.

Washed robustas has now dropped to around 2%, despite the high premium it can attract (typically $500-800 over London, i.e. $380-680 over unwashed robusta). In February 2002, with

London trading at $350/ton, washed robusta sold at $860/ton. They are mainly produced by the large farmers and are sold largely into the Japanese market, but there has recently also been some interest in the US gourmet market.

Zimbabwe currently earns a small premium (5-25¢/lb) over New York on its best coffee. In our view, this under-estimates its potential as a mild coffee more comparable to certain central Americans than to the more acid east Africans. As we have noted (section 3.2.4) in discussing the impending possible change in ownership structure, it is essential that the authorities do their utmost to maintain and enhance the existing quality of Zimbabwean beans.

3.3.6 Points of constriction in the coffee chain

The importance of points of constriction in the coffee marketing chain has been discussed in Section 2.4.1. Points of constriction points pertain to specific stages in the commodity or marketing chain where a substantial number (preferably all) of farmers (or primary processing factories, or farmers' associations), deliver their production to a primary processing factory, a milling company, an auction, or an exporter. In incompletely liberalised structures, regulatory arrangements or physical processing requirements of the commodity may require all farmers to deliver at one point. Non-performance on a commodity contract gives rise to significant costs in case of a point of constriction, as the penalty on default is denial of the possibility of future business which is a credible threat if there are no or few alternatives. For this reason, and along with providing a specific processing, financing or marketing service, these points of constriction offer excellent opportunities to retail price insurance services to farmers or to cooperatives.

In the **Ethiopian** coffee sector the auction is the obvious point of constriction since all coffee has to pass the auction. This puts the Coffee and Tea Authority (CTA) in a strong position to play an important role in the implementation and distribution of price risk management to farmers. Next to the auction there are no other clear points of constriction in the coffee commodity chain in Ethiopia.

Kenyan coffee growers are obliged to be members of cooperatives if their acreage is less than 2 ha (4 ha. from April 2002). As a result the cooperative societies remain the main channel through which smallholder farmers undertake primary processing of their coffee cherries. The position of cooperatives is strong both institutionally as well as politically. This makes cooperative societies a natural point of constriction in the supply chain. A second point of constriction is the Nairobi Coffee Exchange in combination with the Kenya Planters' Cooperative Union (KPCU), the dominant milling company.

In **Tanzania** points of constriction are much less obvious compared to Kenya. Unions may aggregate sufficient production to be considered as a point of constriction. However, apart from KNCU, which already features in an ITF price risk management proposal (see ITF, 2001), there are few well functioning unions. There is no longer any obligation on farmers to maintain membership of a cooperative and many in Tanzania see voluntary farmer groups as having a brighter future. These farmer groups, however, compete with other buyers for cherries from farmers and farmers are free to choose between cooperatives and other buyers in the market even when they are members of an association. This reduces the attractiveness of farmer associations as points of constriction. The Moshi Coffee Auction (MCA) may act as a point of constriction, on the basis that all Tanzanian coffee has to pass through this auction.

The **Ugandan** coffee marketing chain is fast and efficient. Cooperatives are generally weak and at this stage there are few nuclear farms. Coffee is sold directly by farmers to exporters of their agents and there is no auction. We do not see any usable points of constriction in this chain.

The predominant role ZCM in processing and marketing in **Zimbabwe** makes it a clear point of constriction in the marketing chain.

3.3.7 Exchange rate regime and foreign exchange controls

The question arises whether the foreign exchange authorities of the countries considered in this study impose foreign exchange control restrictions that could restrict the ability of companies to buy and sell risk management instruments.

With respect to the exchange rate development in 1990s we observe the following. In Ethiopia the Birr has been devalued with 50% in 1993 and since May 1993 a flexible exchange rate has been adopted established through frequent foreign exchange auctions. Over the period from 1990-1999 depreciation in these countries ranges from 14% (Tanzania) to 18% (Ethiopia) annually with the exception of Zimbabwe where the annual depreciation during this period is on average twice this level with major depreciations in 1998-1999 and 2000. All five countries of the countries we consider introduced flexible exchange rate regimes, free access to foreign exchange and fully convertible currencies, either in the course of the 1990s or earlier. However, these regimes are severely compromised in two of the countries.

In **Ethiopia** the exchange rate regime may rather be characterised as 'managed'. Both supply of and demand for foreign exchange are under the influence of the government, that auctions limited amounts of foreign exchange, and may curtail imports, that would require foreign exchange. Exporters may also keep part of their foreign exchange earnings, but they are not free to use these foreign exchange earnings for hedging purposes. If the coffee sector in Ethiopia is to benefit from international markets – both spot and futures – this would require more liberalization of the foreign exchange market, which is however not planned.

Zimbabwe now operates an effective two tier exchange rate system. The official exchange rate remains at Z$55:$1 while the free market rate is, at the time of writing, between Z$500:$1 and Z$800:$1. Exporters are obliged to convert 40% of their earnings at the official rate but can convert the remainder at the market rate. This gives rise to a so-called blended rate. The benefit of the two tier system to the public is that fuel is purchased by the government using forex obtained at the official rate, and this results in fuel prices which must be among the lowest in the world.

Forex accounts are allowed but receipts must be liquidated within 90 days. Firms registered under export promotion legislation can retain earnings for longer, and some coffee farmers with their own processing facilities have registered in this capacity. Non-official imports must be financed at the market rate, but these require access to funds which is simplified by the presence of a forex account without a time limit. Coffee farmers reported to us that they are currently obliged to spend a significant proportion of time on foreign exchange management.

4 Coffee prices

4.1 The coffee terminal markets

4.1.1 The NYBOT arabica market

The principal arabica coffee futures exchange in the world is the "C" contract of the New York Board of Trade (NYBOT) which incorporates the Cocoa, Sugar and Coffee Exchange. African and Central American mild arabica coffees are prices against nearby NYBOT quotations. The contract specification is 37,500 lbs (very slightly in excess of 17 tons). Five contracts are traded per year (Mar, May, Jul, Sep, Dec). Trading is by open outcry. Delivery is in the ports of New York, New Orleans or Miami. From December 2002, European delivery will also be possible in Antwerp and Hamburg/Bremen.

Kenyan, Tanzania and Ugandan arabica coffees are deliverable against the C contract at zero basis. Neither Ethiopian nor Zimbabwean beans are deliverable, but for different reasons. Most Zimbabwean coffee is exported to the UK and US Atlantic seaboard delivery has not been an issue. It is possible that Zimbabwe may consider applying for deliverability against the C contract given the new possibility of north European delivery. Ethiopia, by contrast, exports unwashed arabicas which are comparable to similar beans exported from Brazil and not to the mild arabicas specified by the C contract.

The NYBOT also trades a mini-coffee contract of 12,500 lbs (5.7 tons) which is cash-settled against the C contract. The mini-contract is intended to appeal to small speculative traders.

4.1.2 The LIFFE robusta market

The principal futures market for robusta coffee is LIFFE. The market was previously operated by the London Commodity Exchange and prior to that by the London FOX. African robusta coffees are prices against nearby LIFFE futures quotations. The contract specification is 5 tons, less than one third of that on the NYBOT. Six contracts are traded per year (Jan, Mar, May, Jul, Sep, Nov). Trading switched from open outcry to the automated LIFFE Connect system in November 2000. Tanzanian and Ugandan robusta coffee is tenderable against the LIFFE contract. The remaining three countries we consider (Ethiopia, Kenya and Zimbabwe) do not export robusta coffee – see Section 3.1.

4.1.3 Other markets

There are two less important international futures exchanges trading coffee futures: the Brazilian Bolsa de Mercadoria and Futuros (the BMF) and the Tokyo Grain Exchange in Japan. Both coffee futures and options are traded in the Sao Paulo-based BMF. The underlying coffee of the futures contract is Brazilian arabica (green coffee), deliverable in Sao Paulo. Contracts are denominated in US$ and contract size is 100 bags of 60 kg (i.e. 6 tons). Five contracts are traded per year (March, May, July, September and December). In April 2002 volume and open interest were 46,001 and 20,552 (futures), 1,466 and 2,317 (call options) and 1,401 and 855 (put options). It is possible that Ethiopian unwashed arabica has a better basis with BMF than with NYBOT.

The Tokyo Grain Exchange started trading both an arabica and a robusta futures contract in June 1998, with delivery specified at the ports of Yokohama, Nagoya or Kobe. Contracts are

denominated in Japanese yen (arabica: per bag of 69kg; robusta per 100kg). The contract size for the arabica contract is 50 bags (3,450kg) and for the robusta contract 5 tons. Delivery months for both arabica and robusta are January, March, May, July, September, and November, and, hence, there are six contracts per year. No African arabica or robusta is tenderable.

4.1.4 Market quality

All available measures indicate that the NYBOT arabica market is more liquid than the LIFFE robusta market. This may be seen from Table 4.1 which compares annual daily trading volumes, open interest and option trading volumes in the two markets. Note that, because of the difference in contract size between the two markets, we have scaled the LIFFE volume and open interest figures to put these in terms of equivalent 37,500 lb contracts.

In terms of equivalently sized contracts, futures trading volume is approximately four times as high on the NYBOT compared with LIFFE, while open interest is two or three times higher. This indicates that it may be easier to find a counter party on the NYBOT market than on LIFFE, particularly for larger transactions, although in practice both markets have adequate liquidity for normal-sized transactions. However, despite this pre-eminence in futures, the two markets have tended to exhibit less diverging volumes in terms of options activity. There has been a surge in options transactions both on the NYBOT and LIFFE over the past twelve months, and it is difficult to foresee which market become dominant in coffee options trading.

Table 4.1Volume and Open Interest, NYBOT and LIFFE, 1997-2001

	Futures Volume		Futures Open Interest		Options Volume	
	NYBOT	LIFFE	NYBOT	LIFFE	NYBOT	LIFFE
1997	9214	1804	137	218	28787	12412
1998	8421	1517	118	190	32522	10980
1999	10646	1851	118	222	44386	14339
2000	8599	1741	94	141	46353	17192
2001	8970	1852	155	97	55658	26893

London markets traditionally attract less speculative interest than American markets, and it is widely believed this is true of the NYBOT and LIFFE coffee markets. However, absence of comparable data makes it difficult to verify this claim. Hedgers have little choice over the two markets – an arabica producer will normally find a much better hedging basis on New York, and a robusta producer in London. By contrast, speculators will trade where trading costs and liquidity make this attractive, although often with a bias towards a local market – implying the NYBOT for the majority of US-based speculators and commodity funds. This advantage in favour of New York may have become more acute as the result of an apparent widening of the LIFFE coffee bid-ask spread subsequent to the 2000 move to electronic trading.

4.2 Basis risk

4.2.1 Basis risk - measurement

The basis is the difference between any two prices. The most important basis is the difference between the price that it is proposed to hedge and the futures price against which the hedge is made. These two prices do not need to be identical, but it is important that they move closely together. Basis risk is the risk that they move independently. This risk is measured by (one minus) the correlation between changes in the price P to be hedged and changes in the futures price F against which the hedge is made. The price difference is defined to be the difference over the period of the intended hedge. Basis risk may be different for short and long term hedges, particularly since longer term hedges are more likely than short term hedges to span crop years. Basis risk may also differ according to the grade of coffee.

4.2.2 Local prices

The measurement of basis risk requires that we have good measures of both local prices and the futures market price. The latter requirement is not problematic, but the former is less easily satisfied.

There are two possibilities. The first is to use an auction price. Auctions give rise to clearly measured and recorded prices but there may be problems of seasonality (less good coffee may be sold at the start and end of the season). There is also the important issue of which of the many prices per day obtained at an auction to take as representative. Our preferred choice is to use a median price, if possible by grade or by most important grade. The median has the advantage over the mean that it is not influenced by extreme high or low prices.[22] Auction prices are available for Ethiopia, Kenya and Tanzania. For Uganda and Zimbabwe, we have information on export prices, and we can again take a median of these.

4.2.3 Basis risk and futures-based hedging

The extent of basis risk determines the quality of an outright hedge. Since the cost of a hedge is unaffected by its quality, in cases where basis risk is high and hedge quality low, it is unlikely that the hedge will be regarded as good value for money. Hedge quality is therefore the most important constraint on the likely attractiveness of any proposed risk management scheme. A commonly used rule of thumb is that the correlation between the changes in the price to be hedged and the futures price should be at least 0.8, and ideally 0.9, for the basis risk to be acceptable.

Exporters typically sell on a differential basis. That is to say, a contract will be sold at an agreed and fixed differential with respect to the relevant contract on the relevant terminal market – New York plus $40 or London less $20. This practice is common throughout the commodity industries. This leaves the exporter with the exchange price risk which he will fix or hedge at a time that he considers opportune. Because his differential is fixed, he does not bear differential basis risk.

That does not apply to coffee farmers or cooperatives who are obliged to sell on an outright basis. They therefore bear both the exchange price and the differential risk. Basis risk is

[22] Off-grades can sell for extremely low prices while some top quality beans sell for prices which bear little relation to the prices obtained for other coffees sold at the same auction.

therefore a serious problem in offering insurance to farmers, but not for the normal commercial activities of exporters.

4.2.4 Basis risk and price floor guarantees

A poor correlation between the exchange price and the price to be insured undermines the effects of hedging using exchange futures contracts. However, it does not directly follow that price floor guarantees, backed for example by an OTC option, would be similarly affected. This is because, in looking at price floors, we are concerned only with downward movements in price of a magnitude sufficient to trigger payment. What is of interest for this question is whether a qualifying decline in the local price is or is not associated with a comparable decline in the exchange price.

This question is more difficult to answer than the earlier question of the efficacy of futures hedging. In particular, it will depend on design features of the price guarantee (how far out of the money and over what period averaging takes place). For these reasons, it may be necessary to perform stochastic simulations to obtain precise estimates of hedgability. In what follows, we adopt a simpler measure. We consider purchase of a price floor 10% beneath current prices in terms of the relevant exchange contract, and ask on what proportion of occasions in which the local price declined by 10% would this insurance have paid.

4.3 Basis risk for east African coffee producers

4.3.1 Arabica basis risk – Ethiopia

In principle, we can perform basis risk calculations for Ethiopia. However, foreign exchange regulation is highly restrictive in Ethiopia. As a result international hedging transactions by Ethiopian exporters are currently not allowed and international roasting companies are prohibited from buying coffee in Ethiopia (see also Section 3.3.4 and 3.3.7). For these reasons we did not pursue the issue of basis risk for Ethiopian arabica further (obtaining the appropriate data, undertaking the basis risk calculations). We nevertheless regard it as unwise to speculate in relation to the likely results of calculations for this country.

4.3.2 Arabica basis risk – Kenya

In this section, we discuss basis risk for Kenyan arabica. The Kenyan calculations derive from data from the Nairobi Coffee Exchange (NCE). In what follows, we distinguish Kenyan coffee according to three grades:

- AA grade coffee;
- AB grade coffee (the most important group)[23];
- C grade coffee;

NCE prices are calculated as the median price by auction date of these three grades. Use of the median (rather than the mean) reduces the impact of very high or low prices that are likely to be unrepresentative. We have also calculated an amalgam price of grade AB and C as these

[23] At NCE 28 different grades of arabica coffee are traded. Grade AB is by far the largest with an average share of 40%, and grade C and grade AA come in second and third place with average shares of 14% and 9%. Next to these major grades there are a few other grades with some quantitative importance of 5-10% of total volume, and the remaining grades have marginal shares (figures are based on auction data of the period November 1999 – March 2002)

represent the major grades of all coffees traded in quantitative terms. The combined price is calculated as the weighted average of the median price of AB grade and the median price of C grade with volume shares as weights.

Figure 4.1 NCE and NYBOT Prices, 1999-2002

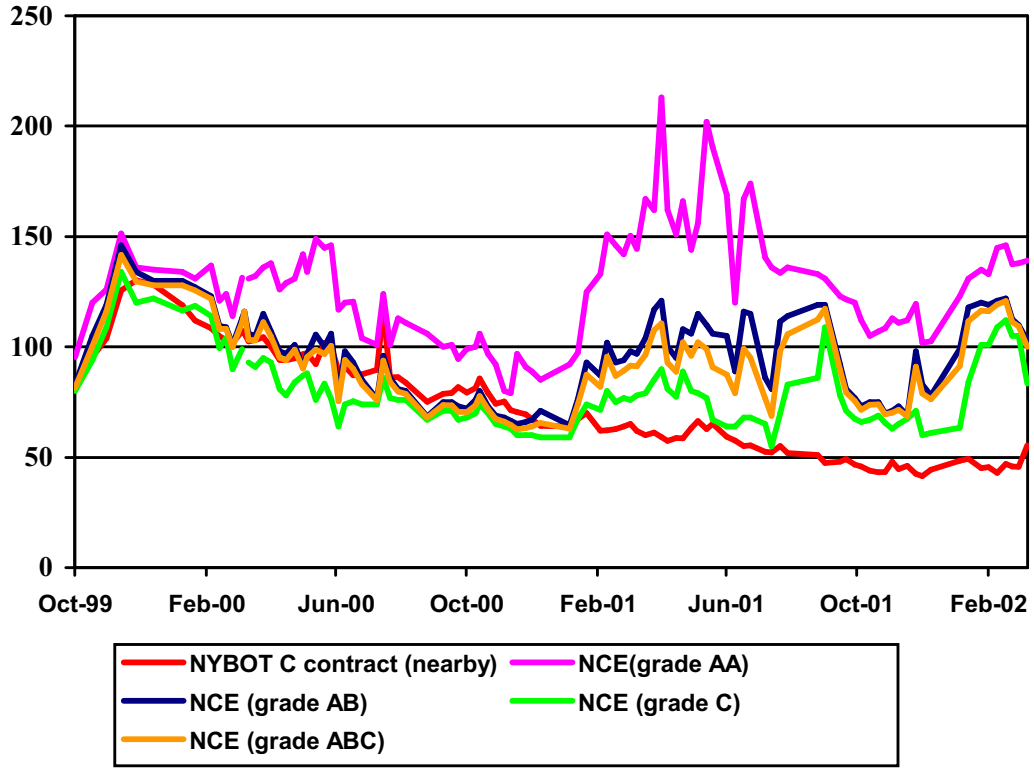


Figure 4.1 graphs the NYBOT nearby price against NCE prices for different grades from October 1999 to March 2002. It is clear that the differential of grade AA prices and other Kenyan grades at auction is substantial, almost throughout the sample period, but there is very little variation in the differential between the prices obtained by Kenyan AB and C grades. The differential between Kenyan and NYBOT prices widened sharply from February 2001.

This is also apparent in Table 4.2 which gives the correlations between the four week price returns for the four Kenyan coffee grades indicated above and the NYBOT nearby price for the 1999-2000, 2000-01 and 2001-02 crop years. Tables 4.3 and 4.4 give the same calculation for twelve and twenty-six week holding periods.

Table 4.2 Correlation of Nairobi Coffee Exchange and NYBOT* returns (4 weeks)

Crop Year	AA	AB	C	AB and C
1999-00	0.5972	0.7228	0.7778	0.7479
2000-01	0.0844	0.2465	0.1256	0.1538
2001-02	-0.5183	-0.0434	-0.4317	-0.5442
1999-02	0.1849	0.4334	0.3374	0.2887

* 'C' contract

Table 4.3 Correlation of Nairobi Coffee Exchange and NYBOT* returns (12 weeks)

Crop Year	AA	AB	C	AB and C
1999-00	0.6510	0.7920	0.7590	0.8154
2000-01	0.4272	0.1903	-0.1816	0.2705
2001-02	-0.7082	0.4102	-0.7231	-0.4859
1999-02	0.4017	0.3614	0.2687	0.4369

* 'C' contract

Table 4.4 Correlation of Nairobi Coffee Exchange and NYBOT* returns (26 weeks)[24]

Crop Year	AA	AB	C	AB and C
1999-00	0.2760	0.2164	0.2690	0.2566
2000-01	0.2388	0.2420	0.0592	0.2194
1999-01	0.2234	0.1423	0.0797	0.2011

* 'C' contract

The lessons from the calculations reported in Tables 4.2 – 4.4 is that basis risk in Kenya is varying from moderate to high. Recall that the variance reduction through a futures hedge is given by the squared correlation coefficient. There does appear to have been an acceptable variance reduction in 1999-2000 over 4 and 12 week periods, but not over the longer 26 week period. However, the hedge against the NYBOT disappears in 2000-01 and 2001-02.

We believe that the divorce of the NCE and NYBOT prices relates to the fundamental over-supply of coffee in the world market which has drive the world coffee price down to unprecedentedly low levels (in real terms). However, despite the aggregate over-supply position, the Kenyan crop has been poor and Kenyan coffee has been in relatively tight demand, partly as the consequence of low yields over the past two crop years brought on by poor rainfall. Although roasters are able to substitute coffees from different origins against each other to some extent, this is apparently less true of Kenyan coffee than of coffee from other origins because of the success of Kenya in establishing itself as a brand. The consequence is that Kenyan coffee prices fell by much less than NYBOT prices during 2001. This makes risk management both more difficult but also less necessary.

We now turn to the issue of whether an NYBOT price floor would give a good hedge for Kenyan coffee farmers. The results of this analysis are given in Table 4.5 (4 week horizon) and Table 4.6 (12 week horizon). The table gives the number of weeks in each crop year that the NCE price fell by more than 10%, and the percentage of these weeks in which a NYBOT-based option would have paid out.[25] Note that there are insufficient observations available for 2001-02 to give reliable estimates. Results for the 26 week horizon (not shown) are similar to those for the 12 week horizon in 1999-2000, but display a number of peculiar features for 2001-02.

[24] There is currently insufficient data to allow calculation of 26 week returns for 2001-02.

[25] Because of weeks in which there is no NCE auction, Table 4.5 covers 37 returns in 19999-2000, 39 returns in 2000-01and 89 returns in 2001-02. Similarly, Table 4.6 is based on 36 returns in 19999-2000, 35 returns in 2000-01and 77 returns in 2001-02.

Table 4.5 Effectiveness of NCE Price Floor Guarantees Backed by NYBOT Options (4 weeks)

Crop Year	AA		AB		C		AB and C	
	weeks	%	weeks	%	weeks	%	weeks	%
1999-00	7	42.9%	9	44.4%	11	36.4%	9	55.6%
2000-01	13	30.8%	9	55.6%	12	41.7%	12	41.7%
1999-02	21	33.3%	18	50.0%	24	37.5%	22	45.5%

Table 4.6 Effectiveness of NCE Price Floor Guarantees Backed by NYBOT Options (12 weeks)

Crop Year	AA		AB		C		AB and C	
	weeks	%	weeks	%	weeks	%	weeks	%
1999-00	17	94.1%	21	95.2%	23	91.3%	23	91.3%
2000-01	15	100%	4	100%	11	81.8%	12	100%
1999-02	32	96.9%	25	96.0%	34	88.2%	35	94.3%

The numbers given in Tables 4.5 and 4.6 paint a significantly more optimistic picture than those for the futures-based hedge in Tables 4.2 and 4.3, in particular with regard to the longer (12 week) hedge. Furthermore, there is little evidence of any decline in options-based hedge quality over 2000-02. The reason for this difference appears to be that, although the decline in New York prices over this latter period was not matched by a comparable decline in the prices for Kenyan coffee, this relative buoyancy of Kenyan prices would not have undermined the price floor guarantee. Indeed, Kenyan farmers would found themselves compensated for price falls did not affect them.

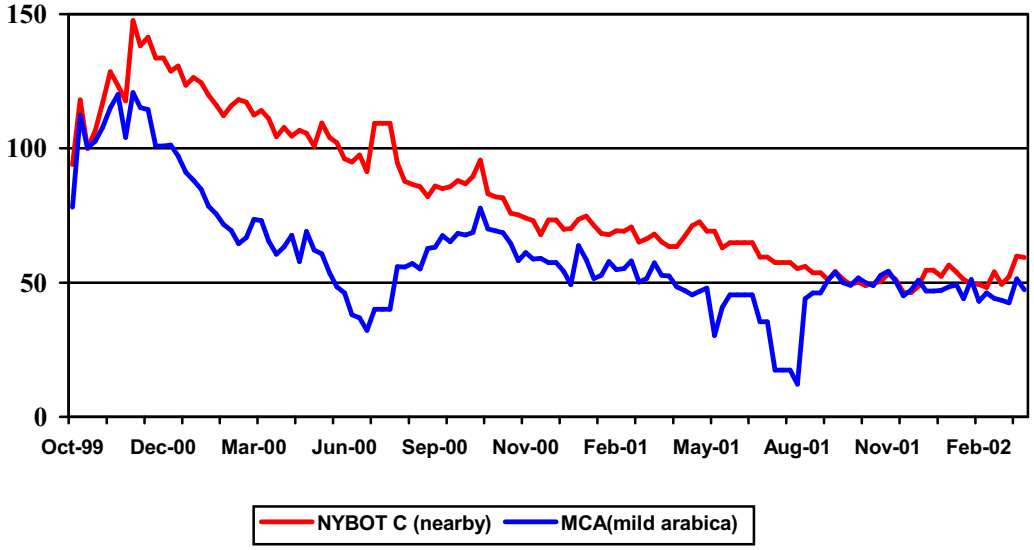
These conclusions come with a health warning – they are based on relatively short samples of overlapping observations. The movements in the Kenyan differential over New York were favourable over the period examined, but there is no reason to suppose that this will necessarily be the case in the future. A more thorough analysis would involve a stochastic bootstrap simulation using a longer sample of data.

4.3.3 Arabica basis risk - Tanzania

For Tanzania, we currently lack the data to undertake basis calculations by grade.[26] Available data relate to the aggregate category of 'mild arabicas' traded at the Moshi Coffee Auction (MCA), for the period of August 1998 to April 2002. The exact nature of the aggregation may have an impact on the outcome of the calculations. Figure 4.2 graphs the NYBOT nearby price against MCA prices for mild arabicas from October 1999 to March 2002. Tanzanian coffee was priced at a discount to NYBOT, but to a varying degree, through the calendar years 2000-01 (see Figure 4.2).

[26] At the Moshi Coffee Auction a total of 14 arabica grades are traded. Grade A (average volume share: 22-26%), grade AA (average volume share: 21-26%) and grade B (average volume share: 28-30%) are the major grades and take around 70% of all transactions.

Figure 4.2 Moshi and NYBOT Prices, 1999-2002



In Table 4.7 correlations are given for the 4 week, 12 week and 26 week price returns for Tanzanian mild arabicas and NYBOT prices for the 1999-2000, 2000-01 and 2001-02 crop years. As with the comparable Kenyan correlations reported in Tables 4.2 – 4.4, the reductions in risk are acceptable in 1999-2000 over the 4 and 12 week periods, but are poor or non-existent in 2000-01 and 2001-02 and at the longer horizon. We believe the same reasons apply as in Kenya.

Table 4.7 Correlation of Moshi Prices and NYBOT 'C' contract returns[27]

Crop Year	4 weeks	12 weeks	26 weeks
1999-00	0.811	0.898	-0.161
2000-01	0.223	0.058	-0.511
2001-02	0.144	-0.163	n.a.
1999-02	0.539	0.586	-0.309

We now turn to estimates of the effectiveness of options-based price floors, suing the same procedure as in the previous section in relation to Kenya. The results are given in Table 4.8.[28] The results are similar to those for Kenya: the hedge is more effective over a 12 week than a 4 week horizon, and there is no apparent deterioration of hedge quality between 1999-2000 and 2000-01. But again, the same health warning applies.

[27] There is currently insufficient data to allow calculation of 26 week returns for 2001-02.
[28] The results for the 4 week horizon are calculated on the basis of 35 returns in 1999-2000, 39 returns in 2000-01 and 93 returns for the entire period 1999-2002. The results for the 12 week horizon are calculated on the basis of 28 returns in 1999-2000, 30 returns in 2000-01 and 70 returns for 1999-2002.

Table 4.8 Effectiveness of Moshi Auction Price Floor Guarantees Backed by NYBOT Options

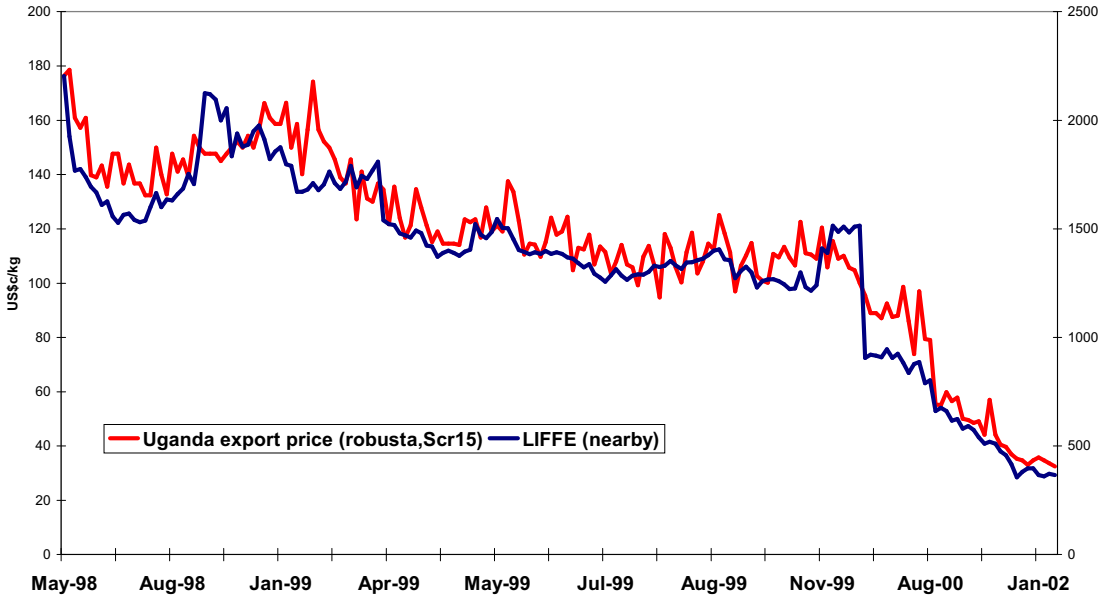
Crop Year	4 week horizon		12 week horizon	
	weeks	%	weeks	%
1999-00	15	13.3%	20	65.0%
2000-01	11	27.3%	18	72.2%
1999-02	28	21.4%	42	64.3%

4.3.4 Robusta basis risk – Uganda

In this section, we discuss basis risk for Ugandan robusta. The calculations are based on export price data for the period 1998-2002 for Screen 15 robusta. This grade (Screen 15) represents by far the largest single grade exported: in the season 2001/2002 the weighted average share of this grade in total robusta exports is 61.6%[29]. For reasons set out above the Uganda export price is calculated as the median price of the transactions made at the relevant day. As a result we do not have Ugandan prices of all dates (there are many days without transactions) and some of the data pertain to days with few transactions, and these may be give rise to less reliable data.

Figure 4.3 graphs the LIFFE nearby price against Uganda export prices of robusta, Screen15 from May 1998 to March 2002. It is clear that Ugandan export prices follow the trend of the LIFFE prices although it fluctuates markedly around this trend. Some of this variability may be attributable to the above mentioned inaccuracies in the Uganda prices data.

Figure 4.3 Uganda robusta export prices (Scr15) and LIFFE prices, 1998-2002



In Table 4.9 we have presented the correlations between the four, twelve and twenty- six week price returns for the Ugandan export price and the LIFFE nearby price for the 1998-99, 1999-2000 and 2000-01 crop years.

[29] The range of robusta grades exported from Uganda include Screen12 to Screen18. Both Screen12 and Screen18 are also the major other grades with shares of , respectively, 16.6% and 10.0% in 2001/2002. Screen18 carries a premium of 30-40% above (Uganda) Screen15, while Screen12 prices move around 20% below Screen15 prices.

Table 4.9 Correlation of Uganda export prices (robusta, Scr15) and LIFFE contract returns

Crop Year	4 weeks	12 weeks	26 weeks
1998-99	49.1%	61.5%	79.3%
1999-00	50.7%	64.4%	78.8%
2000-01	62.3%	66.8%	79.6%
1998-02	48.0%	66.7%	79.1%

Table 4.10 Effectiveness of Uganda Export Price Floor Guarantees Backed by LIFFE Options

Crop Year	4 week horizon		12 week horizon		26 week horizon	
	weeks	%	weeks	%	weeks	%
1998-99		23.5%		72.2%		79.4%
1999-00		50.0%		33.3%		83.3%
2000-01		50.0%		100 %		75.0%
1998-02		30.8%		72.3%		78.0%

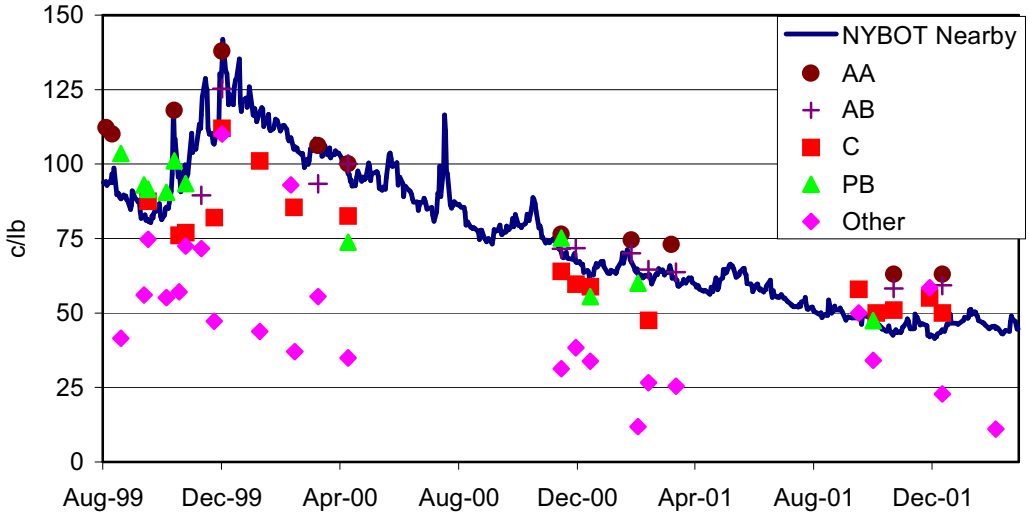
From the calculations reported in Tables 4.9 and 4.10 it may be seen that basis risk in Uganda is substantial at the 4 week horizon, but much lower at the 12 week and 26 week horizons. Over the longer 26 week period, there appears to have been an acceptable variance reduction throughout the entire sample period. We believe that refinement of the data may imply even more favourable basis correlations.. The effectiveness of an export price floor guarantee backed by LIFFE options shows a similar picture. There is some decline in options-based hedge quality in the crop season 1999-2000 at a 12 week horizon but this is due to the few observations for this period.

4.3.5 Arabica basis risk –Zimbabwe

Basis calculations for Zimbabwe are based on tender prices obtained by Zimbabwe Coffee Mill (ZCM). Although these prices are disaggregated by grade, they are likely to contain an unrepresentatively large proportion of low grade packets. This is because many of the largest commercial farmers undertake their own marketing, even in those cases in which ZCM processes the coffee. Despite this, it is to be hoped that ZCM prices are representative for each grade even if the lower grades are over-represented.

The other difficulty arising from use of the ZCM prices is the fact that ZCM registers tenders relatively infrequently – sometimes only once per month and often on only two or three occasions. It is therefore not possible to calculate a time series similar to those reported for Kenya and Tanzania. Prices for the 1999-2000, 2000-01 and the first half of the 2001-02 campaigns are shown in Figure 4.4. The figure shows the AA, AB, C and PB (peaberry) grades tracking the NYBOT C price quite closely with all except the AA grades at a discount to New York. It also shows the large number of other grades trading at highly variable and often very low prices. We conjecture that these grades relate primarily to the smallholder sector. There is some evidence of an increase in the differential during 2001-02.

Figure 4.4 ZCM Tender Prices 1999-2001



Basis correlation calculations are also complicated by the paucity of observations. We have calculated these correlations over 4 and 12 weeks for an average of the AA, AB, C and PB grades, corrected by the average differentials.[30] This index implies a four week return correlation of 0.408 and a twelve week return correlation of 0.825. These correlations suggest an acceptable basis for Zimbabwean coffee, but small number of observations employed suggests caution.

This conclusion applies even more starkly to the put effectiveness calculations. The index price would declined by 10% or more over the following four weeks on five occasions in our dataset. An NYBOT put would have paid out on three of these occasions. Using a twelve week horizon, an NYBOT put would have paid out on all four of the occasions in which the index declined by 10%. This reinforces, albeit weakly, the visual impression from Figure 4.4 that the Zimbabwean differential is relatively stable.

[30] We first estimate the average differential for each grade, and then adjust each price to net out this differential. The price index on any day is the average of the adjusted tendered prices.

5 Risk management possibilities

5.1 Feasibility criteria

Before discussing specific schemes, we need to establish appropriate criteria against which these may be judged. This will involve two elements:

- Which schemes are feasible in each of the countries under consideration?
- Of the schemes judged feasible, which can be recommended as preferred?

In this section, we consider the first of these issues. In so doing, we look at possible schemes against the following set of criteria:

a) Is there an appropriate intermediation agency (Local Transmission Mechanism)? Does the intermediation agency have a substantial out-reach to the local coffee farmer population? How does the intermediation agency channel benefits of price risk management to smallholder farmers and is this transfer of benefits secured? Is the performance record of the intermediation agency in the most recent years acceptable?
b) Is performance risk manageable? In particular, are there any constriction points in the marketing chain that may be used to enforce performance? Is the performance record in the most recent years acceptable?
c) Is the likely extent of risk reduction satisfactory? In particular, how serious is basis risk? What is the quality of a potential hedge?
d) Is there an operational warehouse receipt schemes?
e) Are credit schemes, in place and operative? Are there statutory obligations of commercial banks to lend a to the agricultural sector or the coffee sector in particular?
f) Is the overall financial environment satisfactory? In particular, are commercial banks actively involved in the coffee sector, in particular in providing credit to coffee farmers or cooperatives, and
g) Is there free access to foreign exchange?
h) Is the overall economic and sectoral environment suitable for the operation of a coffee risk management scheme?

Once a scheme is proposed, the issue of replicability across the coffee sector in the country may arise.

5.2 Types of scheme

Here we set out four possible types of risk management scheme. We start out with a scheme in which price floor insurance is purchased on a stand-alone basis, and continue with three further schemes in which price risk management plays a credit enhancement role. These three schemes are classified according to the term of the finance and the stage of the marketing process:

- The collateralization of warehouse receipts allows farmers to obtain payment at the time they deliver their coffee to the processor. This is the furthest stage along the marketing chain and will generally be over a fairly short term (one to two months).
- Harvest finance provides credit to farmers for the employment of harvest labour. This is one stage further back in the marketing process, but will again be for a short one to two month term.

- Input finance enables farmers to purchase necessary inputs. This requirement arises earlier in the production and marketing process and will typically be for a medium term (six to nine months).

5.2.1 Intermediation of price floors to farmers and cooperatives

In Section 2.4.2, we established that the appropriate risk management instrument for smallholder farmers is the price floor, backed by a put option. The most straightforward price risk management scheme is to use an appropriate LTM to intermediate price floors to cooperatives or farmers associations who in turn would make this insurance available to their farmer members as guaranteed minimum prices on the insured quantities. Payment of the premium could either be up-front from accumulated reserves, or on a credit basis as a deduction from eventual auction sale revenues. Any such deduction would be automated thereby reducing performance risk to a minimum.

The prime requirement for the operation of a price floor scheme is the existence of a suitable LTM. However, since premium payment is likely to be on a credit basis, performance is also important and the existence of a suitable constriction point will also be a determinant of scheme feasibility.

5.2.2 Collateralization of warehouse receipts and trade finance

The African coffee marketing chain often sees coffee inventories held in warehouses for a period of one to three months prior to export. This is true particularly in countries that require all coffee to be sold at auction. As noted, auctions are possible points of constriction and so can facilitate the intermediation of price risk management by improving contract performance. At the same time, they increase the need for price risk management by extending the period between the time the coffee is harvested and the time farmers or intermediaries receive payments from exporters.

Warehouse receipt schemes have as objective the collateralization of stocks held in the marketing chain. As such, these schemes do not presuppose the existence of price risk management possibilities, but the use of any stock held under such a scheme as collateral will be increased if the value of this stock can be insured. Insurance could be obtained either by purchase of price floors or through the facilitation of a standard short forward or futures hedge. The latter will be the appropriate model if the proposed beneficiary is an intermediary, who will be primarily interested in preserving the margin between his purchase and sale prices – see Section 2.4.4.

For farmers or cooperatives, either model might be applicable. Our view, however, is that once the harvest is completed, farmers and cooperatives who hold coffee inventory are effectively operating as intermediaries on their own behalf, and are best treated as such. If a short futures position can be established on the basis of the collateralized inventory, the farmer or cooperative essentially locks in the then current base value of the hedged portion of his coffee leaving the determination of the differential to the marketing process. This would give the cooperative the NYBOT price on (say) 80% of the coffee he delivers to the warehouse at the time of delivery, with payment for the remaining 20% plus any differential he obtains at auction on his entire delivery after the auction. The result would be to advance a large part of the payment to the cooperatives by approximately six weeks at a zero or very small expected cost.

(The actual ex post cost would be positive or negative depending the NYBOT price rises or falls over the period between delivery to the warehouse and auction).

The main requirement for a scheme of this sort to become operational is the existence of an efficient warehouse receipts scheme. That will itself presuppose a suitable financial environment in which commercial banks are actively involved in the coffee sector.

5.2.3 Harvest finance

Once coffee cherries are ripe, they need to be picked and pulped rapidly. Delays in picking result in quality deterioration and, if the delays are extended, loss of part of the crop. The availability of labour at harvest time is a major constraint on the ability of smallholder farmers to expand the area they have under coffee production. and forces him to diversify be more than he might otherwise choose. The availability of harvest credit enables this constraint to be relaxed.

Harvest finance can function most effectively in an environment in which an intermediary (the LTM) can assess farmers' crops and therefore their financing requirements. The process may be further facilitated if the LTM is also contracted for delivery of this crop and is in a position to enforce these contracts. Harvest finance schemes will benefit from the availability of price floor price insurance. Furthermore, because the financing requirement is short term (one to two months), the cost of this insurance should be low and typically will be payable on a credit basis against eventual delivery of the crop.

5.2.4 Input finance

Coffee farmers benefit from the availability of finance to purchase inputs, primarily fertilizers. Fertilizer use will tend to be sub-optimal if credit availability is limited or credit is only available at very high interest rates. This motivates input finance schemes. The willingness of commercial lenders to take on this form of financing may be enhanced if farmers, or their representative agencies (cooperatives or farmer associations) can insure against low prices which might limit their ability to repay loans.

We see input finance schemes as benefiting from the availability of price floor insurance. Price floors are the appropriate insurance instrument because the intended beneficiaries are farmers, or cooperatives and associations working on their behalf – see Section 2.4.2. The use of price floors for this purpose would be a specific example of the general price floor insurance model proposed above in Section 4.2.1.

Input finance schemes rely on the ability to keep performance risk at an acceptable (i.e. low) level. The existence of a constriction point in the supply chain is therefore crucial to the viability of such schemes. Input finance schemes also rely on the overall quality of the financial environment, and in particular the existence of banks or other possible LTMs keen to lend to the coffee sector.

A general difficulty with input finance schemes is that, once lent, funds are fungible and, because smallholder farmers are generally highly diversified across crops, the finance may be used for purposes other than the purchase of inputs. One response to this is to require a high level of monitoring, which can be costly. An alternative response is to acknowledge fungibility and to reformulate programmes as a general medium term finance facility.

5.3 Costs

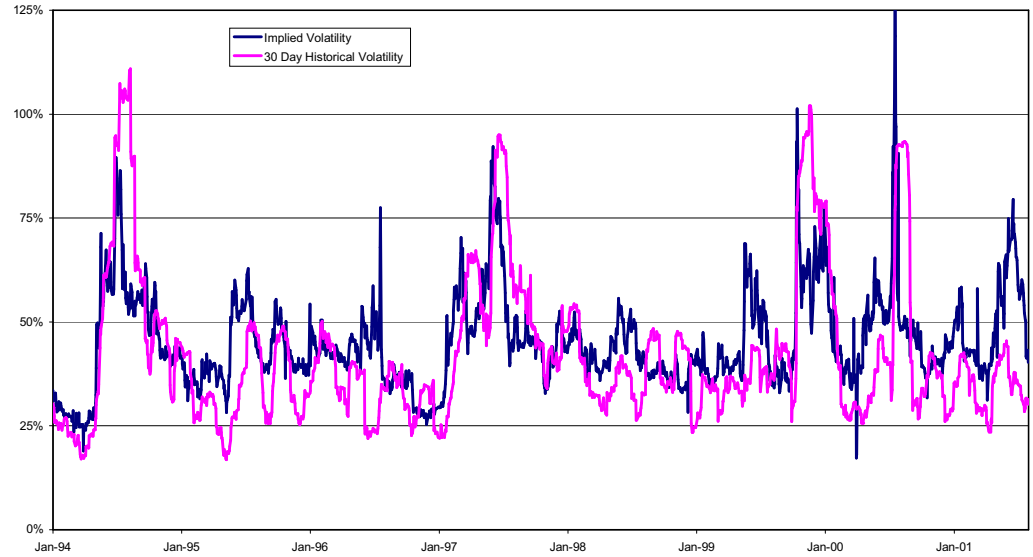
The cost of risk management depends on the type of scheme adopted. Futures based schemes imply only small direct costs but will entail margin finance facilities which may be expensive. By contrast, options-based (guaranteed floor price) schemes are more like insurance policies and require the payment of a premium (which may be covered by a credit arrangement). However, the cost of a pure guaranteed floor price scheme is limited to the premium and if this is paid on a margin basis, as is often now the case, margin payments are limited to the premium (plus possible interest payments associated with credit arrangements).

5.3.1 Arabica price volatility

Commodity risk management costs depend on the volatility of the commodity futures price. Volatility measures the variability of the underlying futures price. The more variable the price, the more valuable the insurance and the more expensive it will be to provide. Volatility may either be measured in a backward-looking manner, by looking at the past variability of the futures price, or in a forward-looking manner, looking at the anticipated future variability. The backward concept is known as historical volatility and the forward-looking concept as implied volatility. Implied volatility may be regarded as a forecast of volatility in the future. Although the forecasting accuracy of implied volatility figures is not high, the two measures move fairly closely together over the longer term.

Figure 5.1 plots historical and implied volatility for the nearby arabica futures contracts on the NYBOT from January 1994 to April 2002 (July 2001 for historical volatility). Volatility is seen as typically varying between 25% and 50% on an annual basis with occasional sharp spikes up to (and above) 100%. The average implied volatility over the entire period 1994-2001 was 45½% while the average historic volatility over the same period was 42%. These are high figures and imply that risk management schemes for arabica coffee are likely to be expensive. The difference between these two figures is likely to reflect the spread set by options dealers together with the fact they are typically selling rather than purchasing options.

Figure 5.1 NYBOT Arabica Volatility

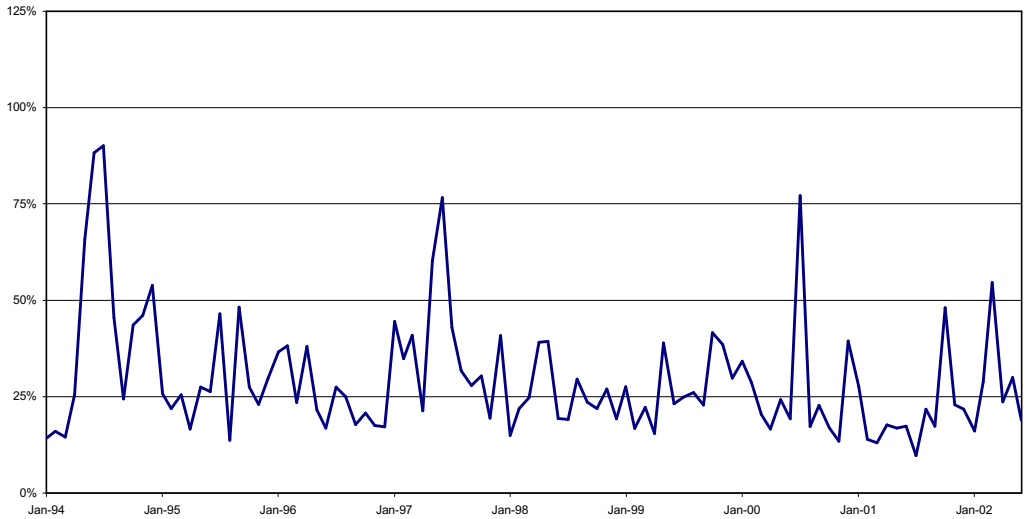


5.3.2 Robusta price volatility

In Figure 5.2, we plot monthly robusta volatility from the LIFFE market in London. Price data are available from January 1998 allowing us to calculate a historic volatility figure. However, LIFFE does not publish an implied volatility series, and the lower volume of trading in exchange options in London would, in any case, make such a figure unreliable.

The volatility pattern is similar in the arabica and robusta markets, but comparison of the two figures shows that London robusta volatility is lower than New York arabica volatility. Average volatility over the four years 1998-2001 was 28% compared with 41% for the New York arabica market over the same period. This implies that price floor guarantees will be significantly less expensive for robusta than for arabica producers.

Figure 5.2 LIFFE Robusta Volatility



5.3.3 The cost of futures-based schemes

Futures based hedging requires a margin-finance facility. Initially, only a small amount of margin need be put up (typically 10% of the value of the futures position), and it is possible that the broker may provide this on behalf of the client. With a long physical position, the offsetting futures position will be short. This will imply that variation margin will be payable in the event of a rise in the futures price. This reflects the risk that the originator may need to cover his short position by buying back at the higher price. Since the hedge is matched by the physical coffee in inventory, the variation margin will be matched by an increased sales revenue once the physical transaction is completed, provided only that there is no adverse shift in the differential basis. To that extent, variation margin only gives rise to a cashflow timing problem. However, failure to establish a suitably large facility can force the originator to close out his position and thereby realize the loss arising from the price rise.

The size of margin finance facility depends on the likely price rise. This depends on the price volatility. In principle, prices can rise arbitrarily high, but there is only a small probability of very large increases. Conventional practice is to estimate the size of facility requires by calculating the Value at Risk (VaR) at a specified probability level – normally 99%. The 99% VaR gives the size of margin facility which will be adequate on 99% of occasions. If hedges are for one month, one should expect this facility to be inadequate approximately for one month every eight years.

To a first approximation, one can assume the futures price distribution is normal (i.e. Gaussian). In this case, the VaR is 2.33 times the futures price volatility. For arabica coffee, using the estimated volatility of 42% from section 5.4.2, this implies a facility of around 96% of the value of the futures position. For a robusta producer, the comparable facility would be a more reasonable 65% of the value of the futures position. However, these estimates may be too low because the price change distribution exhibits excess kurtosis - i.e. there is a higher probability of large price movements than implied by the normal distribution. A figure of 110% may be safer for arabica and 75% for robusta.

Note that a margin finance facility is a capital expenditure, and that it will earn the money market interest rate. Supposing the originator is a net borrower of funds, the income cost of the facility is therefore the difference between the originator's borrowing rate and the risk-free rate of interest. If this difference is, say 5% on an annual basis, the income cost of the futures scheme would be 5½% (= 5% x 110%) on an annual basis for the arabica producer and 3¾% (= 5% x 75%) for the robusta producer. However, these costs will differ according to the financial quality of the hedging institution, and will become prohibitively high for an institution which is unable to borrow on the commercial market.

5.3.4 The cost of options-based schemes

The critical determinants of the price of any option are

- the extent to which the guaranteed price is above or below the current price of the futures contract against which it is priced (i.e. the moneyness of the option);
- the term of the option;
- the volatility against which the option is priced;
- the spread charged by the provider of the guarantee.

(The risk-free rate of interest is a less important determinant of the option price).

Moneyness directly affects the price of an option because it determines both the probability that the option will be exercised (i.e. that the guarantee price will be above the price that triggers payment), and the amount of money that will be paid to the purchaser in that event. A high in-the-money guarantee will be expensive both because it is likely that the reference price will be less than this level and because payment will be based on the difference between the guaranteed price and the reference price. An out-of-the-money guarantee, set beneath the current futures price will be less expensive because it is unlikely to be exercised and will pay less in the event that it is exercised.

There is general agreement that if commodity price guarantees are to be priced at levels at which they will attract coffee farmers or cooperatives, the guarantee (strike) price should be beneath the current futures price, otherwise the guarantee would become too costly. This may also be rationalized in terms of the view, explored in Section 2.4, that guarantees should be seen as securing minimum required revenues.

The term of the guarantee affects its cost because the longer the term, the more likely is it that moneyness will increase. This reflects the fact that, in mathematical terms, the price of any option is convex in terms of the price of the underlying future – a fall in the futures price will increase the value of the price guarantee by more than an equal increase in the futures price will reduce it.

We have already discussed volatility in section 5.4.1. Option prices are normally quoted in terms of implied volatilities. This practice arises because volatility is a common metric, or measuring scale, against which options with different strike (guarantee) prices and different terms may be compared. A dealer may, for example quote an option at an implied volatility of 45% with a bid-ask spread of ±5%. This terminology indicates that he will sell options priced against an implied volatility of 50% and buy options priced against an implied volatility of 40%. Because coffee options markets are relatively illiquid, we believe a spread of ±5% to be realistic. However, it may be possible to negotiate a reduction on this amount, particularly if a high volume of activity is undertaken.

Table 5.1 gives estimates of the price which would be charged for arabica options over terms of four weeks, three, six and nine months priced at-the-money, 5% beneath-the money and 10% beneath the money respectively. Prices are given as percentages of the futures price. The calculations use a volatility figure of 47½% (the average historic volatility of 42½% plus a 5% spread).

Table 5.1 Estimated Cost of Arabica Price Guarantees

	At-the-money	5% discount	10% discount
4 weeks	5.4%	3.2%	1.6%
3 months	9.3%	6.8%	4.8%
6 months	13.0%	10.4%	8.1%
9 months	15.7%	13.1%	10.6%

If one supposes that the maximum a cooperative would be prepared to pay for a price guarantee is 5% of the current price, the calculations indicate that only short term out-of-the-money protection will be affordable.

Table 5.2 repeats these calculations for a robusta option using a volatility of 33% (the average historical volatility of 28% plus a 5% spread). otherwise, the parameters are the same as those in Table 5.1.

Table 5.2 Estimated Cost of Robusta Price Guarantees

	At-the-money	5% discount	10% discount
4 weeks	3.8%	1.7%	0.6%
3 months	6.5%	4.2%	2.4%
6 months	9.1%	6.6%	4.6%
9 months	10.9%	8.4%	6.3%

These robusta option prices are much more affordable than the comparable arabica options – the cost is only over half for the short term options rising to around two thirds for the longer dated positions.

This comparison provides a strong argument for prioritizing risk management provision in robusta rather than arabica producing countries. Protection is more expensive for arabica producers and, at the same time, is generally less necessary because of the higher level of prices and the existence of quality premia.

5.4 Risk management possibilities

In this section we sketch possible price risk management transactions in the light of the feasibility criteria outlined in Section 5.1. We consider each of the five countries in turn looking first at feasibility and then at the form any intermediation should take. In assessing the possibilities of a price risk management schemes, we take account of both the suitability of the various national organisations to participate in a price risk management scheme as well as their interest and willingness to implement such a scheme.

5.4.1 Ethiopia

Although the Ethiopian coffee sector is fully liberalised, it operates in the context of an economy in which central government still maintains extensive controls. Exporting is entirely in the hands of local Ethiopian firms. All Ethiopian coffee is sold at auction, and the auction system itself now appears to function efficiently (despite apparent problems in past years). Overall, however, marketing is a slow process compared with the other countries we consider in this study, and there is considerable scope for cost reduction. Financing is also poorly developed and banks are currently unwilling to advance funds to domestic traders against warehouse receipts because of concerns about multiple claims.

None of the exporters we interviewed currently make any use of market-based risk management instruments but many expressed a wish to see improved access to these instruments. To that extent, there is major potential for a risk management scheme of the sort envisaged by the CFC. In our view, the main obstacle to such a scheme is the continued existence of foreign exchange controls – firms can bid for foreign exchange, but quantities are rationed and there is no guarantee of any priority.

In terms of the criteria we set out in Section 5.1, our judgements are as follows:

a) Cooperatives do constitute potential LTMs. However, the share of coffee from service cooperatives brought to the auction is currently well below 10% of all deliveries and this share is declining. Nevertheless, cooperatives in the Ethiopian coffee sector may play a role in securing quality premiums for farmers and maintaining quality standards.
b) Auctions are potential points of constriction which would allow performance risk to be managed.
c) Hedge quality is not investigated since foreign exchange regulation does not allow international hedging transactions .
d) No warehouse receipts scheme is in place and none is currently envisaged.
e) No credit scheme is in place and none is currently envisaged and there are no statutory obligations to lend to agriculture.
f) The financial environment is poorly developed with little lending in the coffee sector.
g) Exchange controls would make active any market risk management scheme highly problematic.
h) We are not aware of any problems in the overall economic or sectoral environment which could impede implementation of a risk management scheme.

Criterion (d) effectively rules out a warehouse receipt based scheme for the foreseeable future. Perhaps more seriously, any proposed scheme in the Ethiopian context must depend on resolution of the current exchange control restrictions. We are aware that a price-floor scheme would be welcomed in Ethiopia, we are reluctantly obliged to conclude that it is, for the time being, impracticable.

Our view is that the Ethiopian coffee sector has major untapped potential and is deserving of assistance, but it is premature to include a risk management initiative early in this process. Easing of the current foreign exchange regime is a necessary precursor to such developments. This would also allow overseas buyers direct access to the Ethiopian market and we believe this could result both in lower cost marketing and to the achievement of superior differentials. Both these developments would enhance the price obtained by Ethiopian coffee farmers.

5.4.2 Kenya

Current Kenyan regulations require smallholder coffee growers in Kenya to be members of a cooperative and sell their coffee through cooperatives unless their coffee acreage exceeds four hectares (two hectares prior to April 2002). It was suggested to us that this regulation is maintained for reasons of quality control, and we are sympathetic to this position. At the same time, regulation clearly also offers a high degree of protection to the cooperative sector – in other liberalized African coffee-producing countries, cooperatives experience difficulties in competing with private buyers.

Three features of the Kenyan coffee sector would facilitate an efficient price risk management intermediation exercise:

- In Kenya the Kenya Planters' Cooperative Union (KPCU) is clearly a likely candidate to consider as possible Local Transmission Mechanisms for price risk management. KPCU started in 1937 mainly as a bulk purchasing agency for settler coffee farmers. It later moved into processing and built its own mill and milling remains its principal activity. However, KPCU also advances short term finance to farmers, mainly for the purchase of inputs, and

has some extension activities. It has eleven branches located throughout the coffee-growing areas of Kenya, some of which are involved in the distribution of inputs (mainly fertilizer).

- The Kenyan coffee sector also benefits from a relatively strong agricultural banking system. Kenyan commercial banks have a statutory obligation to lend at least 17% of their funds to the agricultural sector, and although we were told that this requirement is not rigidly enforced, it probably does ensure that banks are more involved in the coffee sector than would otherwise be the case. The Cooperative Bank of Kenya (CoopBank) is the most active lender to the sector and is the channel by which World Bank (Small-scale Coffee Improvement Project, SCIP) and EU (Stabex) funds have been distributed.
- The requirement that all coffee should go to auction makes the Nairobi Coffee Exchange (NCE) a "point of constriction" in the coffee commodity chain. This is important in ensuring timely loan servicing and any required payment of insurance premia.

Turning to the criteria set out in Section 5.1

a) KPCU, the CoopBK and the Building Society of Kenya (BSK) all appear to be very strong candidate LTMs.
b) The Nairobi Coffee Exchange is a potential point of constriction which would allow performance risk to be managed.
c) The basis risk calculations reported in Section 4.3.2 indicate that although futures hedge quality may be poor, this is less clearly so for price floor guarantees.
d) No warehouse receipts scheme is in place and none is currently envisaged.
e) An input finance scheme is projected; Kenyan commercial banks have a statutory obligation to lend at least 17% of their funds to the agricultural sector.
f) The financial environment is well developed; one bank is active in the coffee sector and in the cooperative sector in particular; other banks expressed interest in the coffee sector once sufficient guarantees are in place.
g) The foreign exchange environment is permissive.
h) We are not aware of any problems in the overall economic or sectoral environment which could impede implementation of a risk management scheme.

On the basis of these criteria, we believe that the intermediation of price floors to cooperatives, either through KPCU , CoopBank or the BSK, would in principle be feasible if an improved basis were obtainable. In that case, we see the possibility of linking a price floor scheme with the CFC's planned Input Finance Scheme. However, irrespective of basis risk, the current absence of a warehouse receipts scheme suggests that any consideration of a futures based scheme to secure the value of collateralized inventory be postponed.

5.4.3 Tanzania

Although the Tanzanian coffee sector has certain broad similarities with that in Kenya, see Section 3.3, many of the important institutions are significantly weaker. In particular

- Tanzanian cooperatives are obliged to compete with private buyers, whereas in Kenya, smallholder farmers are required to sell through cooperatives. In general, the private buyers have performed better in this process with the result that many cooperatives are now financially weak and have low market shares. We judge that the Kilimanjaro National Cooperative Union (KNCU) is the only union which has maintained sufficient presence and strength to act as a risk management LTM.

- The Moshi Coffee Auction functions less effectively than its Kenyan counterpart at Nairobi, mainly because a large proportion of sales sees exporters repurchasing their own coffee. While it is still a potential point of constriction, this judgement must be qualified by uncertainties over the future development of the auction.
- Commercial banks are less actively involved in the Tanzanian coffee sector than are their Kenyan counterparts.

A countervailing consideration is the CFC's planned Warehouse Receipts Scheme in Tanzania, which, is however not yet operational.

In terms of the criteria set out in Section 5.1

a) The KNCU is a potential LTM but we note that KNCU is already collaborating with the ITF in this regard. We doubt whether other cooperative unions are sufficiently strong to take on this role. Current policy appears to be evolving towards voluntary farmers associations, but we regard it as premature to suppose that these associations could act as risk management LTMs.
b) The Moshi Coffee Auction is a potential point of constriction which might allow performance risk to be managed, but it has not operated well over the recent past, and it is too early to evaluate the impact of recent reforms.
c) The basis risk calculations reported in section 4.3.3 indicate that although futures hedge quality may be poor, this is less clearly so for price floor guarantees.
d) The CFC is currently organizing a warehouse receipts scheme that could form the basis for a futures-based system for advancing payments to users of the scheme.
e) No credit scheme is in place and none is currently envisaged and there are no statutory obligations to lend to agriculture.
f) Although the financial environment is generally well developed, relatively few commercial banks are currently active in the coffee sector.
g) The foreign exchange environment is permissive.
h) We are not aware of any problems in the overall economic or sectoral environment which could impede implementation of a risk management scheme.

On the basis of these criteria, we do not believe that the intermediation of price floors to cooperatives to be feasible beyond the scheme already proposed by the ITF which will use KNCU as LTM. Furthermore, the futures basis risk leads us to be sceptical with regard to the possibilities for a futures-based scheme to operate in conjunction with the CFC's projected Warehouse Receipts Scheme.

5.4.4 Uganda

Robusta coffee is a much more simple commodity than arabica, and this simplicity is reflected in the Ugandan robusta marketing system. Furthermore, the Ugandan coffee sector is more fully liberalized than that in Kenya, and the overall economic environment is more liberal than that in either Kenya or Tanzania. Cooperatives are weak (Section 2.4e) and we do not believe they are suitable LTMs for price risk management. Furthermore, Ugandan coffee exporters are free to integrate directly back to purchasing at the farm and there is no auction. The absence of any constriction point would make performance on any credit-based risk management scheme problematic, but by the same token, because marketing is more rapid than in the Kenyan and Tanzanian auction-based systems, it reduces the need for finance.

A countervailing consideration is the CFC's planned Warehouse Receipts Scheme in Tanzania, which, is however not yet operational.

In terms of the criteria set out in Section 5.1

a) We do not see cooperatives as suitable risk management LTMs in the Ugandan context., Our judgement here differs from that reached by the ITF. It is possible that planned nuclear farms may fulfil this role in the future, but it would be premature to reach this judgement on current evidence.
b) We do no see potential points of constriction which might allow performance risk to be managed in a credit-based scheme
c) Hedge quality is moderate, but may improve if based on data with less noise.
d) The CFC is currently organising a warehouse receipts scheme that could form the basis for a futures-based system for advancing payments to users of the scheme.
e) No credit scheme is in place and none is currently envisaged and there are no statutory obligations to lend to agriculture.
f) Although the financial environment is generally well developed, relatively few commercial banks are currently active in the coffee sector.
g) The foreign exchange environment is permissive.
h) We are not aware of any problems in the overall economic or sectoral environment which could impede implementation of a risk management scheme.

On the basis of these criteria, we do not believe that the intermediation of price floors to cooperatives to be feasible, and we are sceptical about the likely success of the ITF scheme in particular if the intention is to roll it out on a large scale. However, we do regard a futures-based scheme operating in conjunction with the CFC's projected Warehouse Receipts Scheme to be practical.

5.4.5 Zimbabwe

Zimbabwe benefits as a potential location for a risk management scheme in the existence of Zimbabwe Coffee Mill (ZCM) which is a clear point of constriction in the marketing chain, and which could also double as LTM. Their experience in intermediating pre-shipment finance from Kingdom Bank to smallholder farmers indicates that they are sensitive to the requirements of smallholder farmers and able to provide for these requirements. Furthermore, the probable increased role of smallholders in the Zimbabwean sector would makes a scheme of this sort invaluable in smoothing the transition associated with the change in ownership structure. A harvest finance scheme would be particularly well-suited to the Zimbabwean environment and ZCM has expressed enthusiasm about this possibility. It is unfortunate, therefore, that both the current foreign exchange regime and the uncertainties associated with the land resettlement programme make it difficult to advance a positive recommendation at this time.

In terms of the criteria set out in Section 5.1

a) ZCM is an ideal LTM for intermediating risk management to smallholder coffee farmers. Moreover, it is keen to take on this role. We believe it would be able to do this in conjunction with Kingdom Bank.
b) As the sole off-farm mill, ZCM is also a point of constriction in the marketing chain.

c) We only could do calculations on the basis of very few observations, which makes the outcomes not fully reliable. Nevertheless, these calculations indicate that hedge quality appears to be acceptable.
d) The CFC is currently organising a warehouse receipts scheme that could form the basis for a futures-based system for advancing payments to users of the scheme.
e) In conjunction with Kingdom Bank, ZCM already operates a pre-shipment finance scheme for smallholder farmers.
f) Although the financial environment is generally well developed, relatively few commercial banks are currently active in the coffee sector.
g) The foreign exchange environment is highly restrictive.
h) There is currently major uncertainty about the future of the coffee sector as the consequence of what can be at best be described as a confused application of the official land resettlement policy. If the transition is poorly managed, it is possible that this could result in a major reduction of the quantity and quality of coffee produced in the sector.

Our overall conclusion is that, although in many respects Zimbabwe would be a good location for the proposed CFC scheme, the highly restrictive foreign exchange regime would make operation of a risk management scheme impossible at the present time. Our view is that the position in Zimbabwe should be reviewed once the country has returned to a free and unrestricted single tier foreign exchange rate regime. By that time, it is also to be hoped that the uncertainty which currently plagues the sector will have been resolved in a manner which ensures increased smallholder production whilst maintaining current yield and quality standards.

5.5 Constraints on implementation and how may these be overcome

Looking across the entire group of countries we have been asked to consider, the major practical implementation constraints we have identified are

a) Restrictions in access to foreign exchange. A liberal foreign exchange environment is required if the LTM is to be able to make hedge transactions on international markets. A feature of such transactions is that orders are executed immediately they are made and therefore cannot await confirmation of the availability of the required currency.
b) Lack of bank involvement in the coffee sector. Credit enhancement is a major objective of risk management. This can only take place in an environment in which commercial banks are favourably disposed to lending to the coffee sector.
c) Adequacy of telecommunications. Reliable telecommunications links are required if price information and hedging decisions are to be reliably communicated both to and within the country.
d) Lack of appropriate technical expertise and control systems. The use of modern risk management instruments presupposes the existence of trained personnel in the implementing LTM, together with control systems to ensure that these personnel do not abuse their positions. It is unlikely that such personnel and systems will be present in organizations that have no history of involvement in these activities. In general therefore, it will therefore be necessary to provide technical assistance to arrive at this point.
e) Uncertainty over the likely future evolution of the sector.

We look at each of these issues in turn in relation to the five countries.

5.5.1 Ethiopia

All of the constraints we have identified except that relating to uncertainty apply to Ethiopia. In particular, an easing of the current foreign exchange regime is a necessary precursor to implementation of any price risk management scheme. This would also allow overseas buyers direct access to the Ethiopian market and we believe this could result both in lower cost marketing and to the achievement of superior differentials.

5.5.2 Kenya

Kenya benefits from a free foreign exchange regime and superior bank out-reach in the coffee sector relative to the other four countries we are considering. The future of the Kenyan coffee sector is assured and there is relatively little uncertainty. Telecommunications are good. Implementation of any risk management scheme will, however, require technical assistance to the selected LTM, which will also need to employ appropriately trained personnel.

5.5.3 Tanzania

Tanzania also benefits from a liberal foreign exchange environment but bank involvement in the financial sector is problematic, with many banks frightened of the sector as the consequence of large losses incurred over recent campaigns. A successful risk management scheme in Tanzania will rely on overcoming this constraint but would then give rise to the same technical assistance requirements as we have identified in Kenya. Furthermore, telecommunications are not as well developed as in Kenya and Uganda, and there is some uncertainty with regard to the effects of the 2002 decision to segregate buying, processing and marketing. Our view is that there may be merit in waiting to see whether, and to what extent, the planned Warehouse Receipts Scheme increases bank involvement in the sector and how the new marketing system evolves.

5.5.4 Uganda

Uganda also benefits from a liberal foreign exchange environment but suffers from similar problems of a lack of bank involvement in the coffee sector. In the Ugandan case the origin of the problem is a perceived low level of profitability of robusta production and marketing rather than past losses which appear to be behind this low involvement. The future of the Ugandan coffee sector is assured and there is relatively little uncertainty. Tele-communications are well developed. As with Tanzania, we regard it as wise to review this position after the implementation of the CFC's planned Warehouse Receipts Scheme.

5.5.5 Zimbabwe

There are two major constraints to implementation of a risk management scheme in the Zimbabwean coffee sector. First, the highly restrictive two tier foreign exchange regime which is currently in place would prohibit hedging transactions. Second, the application of the land resettlement scheme in the coffee sector, which currently appears to be proceeding exactly contrary to stated governmental policy, is creating enormous uncertainty. If resettlement is not well-managed, and this would require significant input of resources, yields and quality are likely to be adversely affected, perhaps seriously so. We do not believe it is possible to recommend a scheme unless and until these uncertainties have been favourably resolved.

5.5.6 Price insurance and low world market prices of coffee

There must be a legitimate worry that low coffee prices will imply that farmers and cooperatives will wither be unable or unwilling to pay the premia required to purchase price insurance. A premium of say 5%, perhaps corresponding to the range which would be acceptable under normal market conditions, is likely to guarantee a price which is so low that farmers will consider the guarantee worthless. Instead, in order to guarantee a price that would cover production costs and provide basic necessities, farmers may be asked to pay an unacceptably high proportion of their expected revenues. An analogy is attempting to buy insurance for ones house when the fire is already eating at the edge of the village.

The implication of these observations is that it is essential to distinguish between market-based price insurance policies and between rural social security schemes. Only by using the latter will the farmer be able to guarantee a price sufficient to cover his production costs and basic expenditure requirements. But a social security scheme will require subsidies at periods of very low prices. In the absence of subsidies, the certainty purchased through an insurance scheme may be a certainty on which the farmers put very little or no value. Some recent discussions of commodity price insurance schemes may be thought to have overlooked this fundamental difficulty.

The practical importance of these comments depends on how low is the exchange price, and on the relationship of the farmgate price to the exchange price. The exchange price is important because this is the price that will be insured, and to which the costs of insurance relate. The differential between the exchange price and the farmgate price is important because it is the farmgate price that is of interest to the farmer. Differentials for robusta producers are typically small, and even when the origin obtains a premium, as in Uganda, the low exchange prices of 2001-02 were scarcely sufficient to cover farmers' processing and marketing costs. We conjecture that few farmers would have been interested in guaranteeing prices at this level. By contrast, Kenyan arabica prices obtained a healthy premium over the New York terminal market price during 2001-02, and may well have considered their margin over production costs worth protection. In the east African context, we therefore judge the potential impact of low prices on the demand for price insurance to be a more serious problem for a potential Ugandan implementation than for an implementation in Kenya.

These remarks require major qualification. Even if a decision is taken to implement a project in the coming months, the project is unlikely to be operational before the 2003-04 seasons or even, possible, the 2004-05 season. It is quite possible that coffee prices will have recovered significantly by this stage if only because the low prices experienced over 2000-02 will generate significant reductions in production. Indeed, over the summer of 2002, prices have already climbed some way above the disastrous level of the 2001-02 campaign. Once prices are above these very low levels, farmers will again have an incentive to protect their expected revenues. It may therefore be a mistake to put a large amount of emphasis on recent low prices.

5.5.7 Summary of country risk management possibilities and constraints

Table 5.2 summarizes the risk management possibilities and constraints by country.

5.6 Recommendations

We have been asked to recommend up to two pilot coffee risk management schemes in Ethiopia, Kenya, Tanzania, Uganda and Zimbabwe. On the basis of the conclusions brought together in sections 5.3-5.5, we are happy to recommend one definite scheme, and a second scheme that could proceed if existing constraints are relaxed. We also make a recommendation with respect to the choice of implementation agency.

5.6.1 A risk management scheme for the Kenyan coffee sector

Kenya emerges as the strongest and least problematic candidate for a pilot coffee risk management project.

- The scheme will provide price risk management to farmers through their cooperative societies. The cooperative sector is strong in Kenya, and we believe that this strength is instrumental in generating the high quality of coffee for which Kenya is famed. It is important to reinforce the cooperative sector, and the best way to do this is by increasing the range of services that cooperative societies can provide to their members.
- The scheme will operate through KPCU as LTM. We have identified KPCU as having outreach to the entire cooperative sector, and not that KPCU is in part owned by the cooperative societies. KPCU is keen to undertake this extension of its activities and we understand that this also has the support of the national government.
- The scheme will make use of the fact that the Nairobi Coffee Auction is a constriction point in the marketing chain. All Kenyan coffee is sold through this auction.
- The scheme will offer three forms of price risk management:
  a) Price floor insurance on an outright basis for a premium payable from the cooperative society's subsequent auction receipts.
  b) Price floor guarantees in association with harvest finance, extending over a period of one to two months. Both loan interest and the insurance premium will be payable from the cooperative society's subsequent auction receipts.
  c) Price floor guarantees in association with input finance, extending over a period of six to nine months. Both loan interest and the insurance premium will be payable from the cooperative society's subsequent auction receipts. We recognize the problems of fungibility of input credit and that the cost of insurance over a period of this length may be prohibitively high. We therefore regard the input finance facility as a lower priority which may be investigated once the CFC input finance scheme becomes operative.
- The price guarantees will be written in terms of the New York C US dollar price. It will denominate a suitable average of New York closing prices. Our calculations indicate that although basis (differential) risk is severe for futures-based hedges for Kenyan coffee, it is less severe for options-based price floor guarantees.
- The scheme sees KPCU providing these three forms of price guarantee in conjunction with a local bank. We have identified the Cooperative Bank of Kenya and the Building Society of Kenya as potential financial intermediaries. A wholesale intermediary would supply these banks with average price OTC put options which would offset the banks' price risk. In Annex D we have presented a flow chart of the proposed transactions.

5.6.2 A risk management scheme for the Uganda coffee sector

The possibilities for a viable risk management scheme in the Ugandan coffee sector are more complicated. Many pre-liberalisation institutions have effectively been dismantled in the 1990s, while new institutions and structures are getting started, but are far from fully established and well-developed. From Section 3.3.6 it is clear that we have been unable to identify a point of constriction that could be instrumental to delivering price risk management to farmers. Nevertheless marketing, banking and other economic environment in the coffee business is well organised and appears to be susceptible to the introduction of price management facilities. Hence, it should be possible to construct a viable scheme in Uganda.

There is a number of possibilities. The first is a futures-based scheme which could be coordinated with the CFC's proposed Warehouse Receipt Scheme.

- We propose that a short futures margin facility be established on the basis of the inventory. Short futures sales will secure the monetary value as well as the physical existence of the inventory and should thereby increase its collateral value. The short futures position will be closed out once the coffee is taken out of inventory.
- The scheme will provide a margin finance facility which should be sufficient in the fact of likely price rises over the inventory horizon (one to two months).
- The scheme will operate in connection with commercial banks which are prepared to provide this line of credit. Users of the scheme will pay a small fee to cover the banks' operating costs and any residual risk they might incur.

An alternative scheme will provide price risk management either on an outright basis to farmers or combined with credit through commercial banks.

- This scheme will operate through commercial banks acting as LTM. We have identified one commercial bank (Centenary Rural Development Bank, CRDB) with a well functioning microcredit programme to farmers (see section 3.2.3). CRDB is eager to replicate its current credit scheme for maize and bean farmers to coffee farmers, and to offer credit in conjunction with a price insurance scheme.
- This scheme could offer three forms of price risk management:
  a) Price floor guarantees purchased on an outright basis, probably for payment of an up-front fee.
  b) Price floor guarantees in association with in harvest finance, extending over a period of one to two months. Both loan interest and the insurance premium will be payable from the farmers' subsequent export receipts.
  c) Price floor guarantees in association with input finance, extending over a period of six to nine months. Both loan interest and the insurance premium will be payable from the farmers' subsequent export receipts.
- A wholesale intermediary would supply CDRB and possibly other commercial banks with average price OTC put options which would offset the banks' price risk or intermediate futures transactions. In Annex D we have presented a flow chart of the proposed transactions.

5.6.3 Choice of implementation agency

It is important to distinguish between implementation of the risk management schemes at a country level and implementation of the wholesale transactions. Country-level implementation will involve:

- coordination with the proposed LTM,
- cooperation with banks,
- consultation with government,
- organization of training and education if required, and
- monitoring.

At the wholesale level, the scheme will involve selection of an offsetting agency and coordination between this agency and the national implementation agency.

It appears to us that these two roles require different skills and experience and are likely to be carried out in different locations. We therefore see merit in splitting implementation.

With regard to implementation at the wholesale level, we note that the CFC is in the process of considering schemes in cocoa and cotton as well as in coffee. There are obvious merits of a single implementation agency for all three schemes, in terms of operating costs. We are also aware that the ITF, through the World Bank, is currently on the point of implementing a number of its own commodity risk management schemes, and that implementation has actually commenced in the ITF coffee scheme in Uganda. It is worth asking whether there may be merit in the C FC and the World Bank adopting a common implementation framework at the wholesale level. An answer to this question would however go beyond the terms of reference of this study.

Turning to the national level, we note that UNOPS is the implementation agency for the planned CFC warehouse receipts and input finance schemes. Our view is that organization of the risk management schemes in the designated countries should also be put in the hands of UNOPS. Technical abilities needed to organise the risk management schemes may require some additional capacity building and training at UNOPS. Nevertheless, giving UNOPS the responsibilities for the risk management schemes will facilitate coordination, reduce the danger of frictions and allow the schemes to proceed with only modest overhead costs. We therefore recommend selection of UNOPS as the national implementation agency.

5.6.4 Regional workshop

A regional workshop will be organised entitled ‘Opportunities and Constraints of Introducing Price Risk Management Instruments in Coffee ion East Africa’, in order to present the contents of the current report and to disseminate the results of the current investigations. It is envisaged that the workshop will take place in Nairobi in the Fall of 2002, but possibly later.

5.6.5 Summary of recommendations

If only one country needs to be selected, we recommend to implement a pilot price risk management scheme in Kenya in the first place. If two countries need to be selected, we recommend Uganda as our second choice. The pros and cons to implement a price risk management scheme differ substantially in these two countries. Favourable conditions to a pilot in Kenya are the more appropriate institutions, a well developed point of constriction that solves the enforcement problem, a well developed telecommunication system and a price level that is

currently attractive to insure. Unfavourable conditions to a pilot in Kenya are the moderate basis risk and relatively high cost of option based insurance. Favourable conditions to a pilot in Uganda are the transparency of price formation & marketing, a well developed telecommunication system, the low cost of option based insurance and the relatively good basis risk. Unfavourable conditions to a pilot in Uganda are the lack of institutions to support a transaction, a potential enforcement problem and a price level that is currently unattractive to insure. In both countries we recommend UNOPS to be the project executing agency.

Table 5.2 Summary of Possibilities and Constraints

	Ethiopia	Kenya	Tanzania	Uganda	Zimbabwe
Sectoral importance of coffee sector (value added, employment, foreign exchange earnings)	high	medium	medium	high	low
Holdings	smallholders	smallholders	smallholders	smallholders	estates
Cooperatives (membership, economically, support)	voluntary, financially& organisationally weak	compulsory, financially weak	voluntary, financially& organisationally weak	financially & organisationally weak	nonexistent
Potential LTM	none	cooperatives, KPCU	none	none	ZCM
Constriction points	auction	auction, KPCU, cooperatives	auction	none	ZCM
Outreach to smallholders (institution and extent)	cooperatives; very limited	cooperatives; good, 100%	cooperatives; very limited	none, (possibly in the future nucleus farms)	ZCM (possibly also in the future nucleus farms)
Price volatility	high	high	high	medium	high
Price differential	variable	high, especially for the best coffee	negative	low but positive	negative, but positive for the best coffee
Telecommunications	poorly developed	well developed	moderately well developed	well developed	well developed
Transport infrastructure	poor	medium	poor / medium	medium	good
Banking environment (agricultural credit)	limited	moderate	limited	limited	good
Banking environment (trade finance)	moderate	moderate	moderate	moderate	moderate
Banking experience at coffee growers and cooperatives	poor	moderate	poor	poor	good
Basis risk between local prices and terminal markets	not known	varying from moderate to high for futures hedges	high for futures hedges	moderate	moderate
Foreign exchange regulation	restrictive	permissive	permissive	permissive	restrictive
macroeconomic stability	low / medium	medium / high	medium	high	low
political stability	medium / high	medium / high	medium / high	medium / high	low
Warehouse receipts			CFC scheme	CFC scheme	CFC scheme
Input schemes		CFC input credit scheme; World Bank scheme			
ITF schemes	no	no	yes	yes	no

Annex A Country Environment

A1 Area, population and ethnicity

Table A1 summarises area, population and population density of the five countries. Ethiopia is the largest country in terms of area, although Tanzania comes close with an area that is 85% of the area of Ethiopia. Kenya, Uganda and Zimbabwe are substantially smaller with an area of around half (Kenya), one third (Zimbabwe) and one fifth (Uganda) of the area of Ethiopia. With over 60 million people Ethiopia also has the largest population, a population that is five times as large as the population of Zimbabwe, between three times and twice as large as large as the population of Uganda, Kenya and Tanzania. Population density is highest in Uganda with more than 100 people per square kilometre, while it is less than a third of this in Zimbabwe (31 people per square km).

Table A1 Area and population

	Ethiopia	Kenya	Tanzania	Uganda	Zimbabwe
total area x 1000ha*	110,430	58,037	94,509	24,104	39,076
population x million persons (1999)**	62.8	29.4	32.9	21.5	11.9
population, average annual growth in %	2.3	2.5	2.9	3.1	2.2
population per square km	62.8	51.7	37.3	107.6	30.8

Source: FAO, 1999 (*) and WDI2001 (**)

Important and numerous sources of instability in most of the countries of this study originate from colonial heritage, tribal tensions and ethnic conflicts. The resulting unstable political environment cause uncertainties and low levels of investment and the effects will be felt throughout the economy and, hence, also in coffee production and coffee trading. With extreme conflicts like civil war but also in less serious situations the unrest may lead to hyperinflation, high public debts and overvalued currencies. With high levels of uncertainty and economic & political instability it is highly unlikely that the introduction of price risk management is feasible.

To a large extent the causes of these conflict originate from ethnic difference in the population. Most countries contain a number of ethnic or tribal groups: Uganda had fifteen major ethnic groups at independence, that divide between Bantu south and the multi ethnic north, and most of these ethnic groups speak different languages or dialects. The Buganda is the largest ethnic group in Uganda. Uganda has experienced severe problems with these two groups. Kenya has thirty officially recognised ethnic groups ranging in size from a few hundred to several million people. The five largest ethnic groups in Kenya, with each ore than a million members, comprise more than 70% of the population[31]. The Kikuyu is the largest ethnic group in Kenya. Tanzania has a great ethnic diversity with roughly 120 tribal groups, speaking a variety of languages, although the larger part is from Bantu origin.

In all these countries various organisational, administrative and political institutions follow ethnic lines and hence have strengthened ethnic divisions and the potential of conflicting interests. Even today leaders and political parties in all these countries are strongly associated with ethnic differences and much less with their political preferences (e.g. Daniel arap Moi

[31] These are in order of magnitude: Kikuyu, Luyha, Luo, Kalejin and Kamba.

president from Kenya is affiliated with Kalinjin and Kamba groups, Mugabe president from Zimbabwe, and his Zanu party are affiliated with the Shona). The relative size of these ethnic groups and their commitment to make coalitions are important aspects of political stability.

All countries in the study have been former colonies (Kenya, Uganda, Tanzania and Zimbabwe were British and became independent in the 1960s; Ethiopia was only a colony for a short time in the nineteen thirties and is not normally thought of as an ex-colonial country). With the exception of Ethiopia all these countries are still digesting the remains of the colonial era: Zimbabwe is in this respect the most clear example as it is currently undergoing a major land reform that is strongly motivated by feelings of resentment against colonial exploitation.

A2 Macroeconomic environment

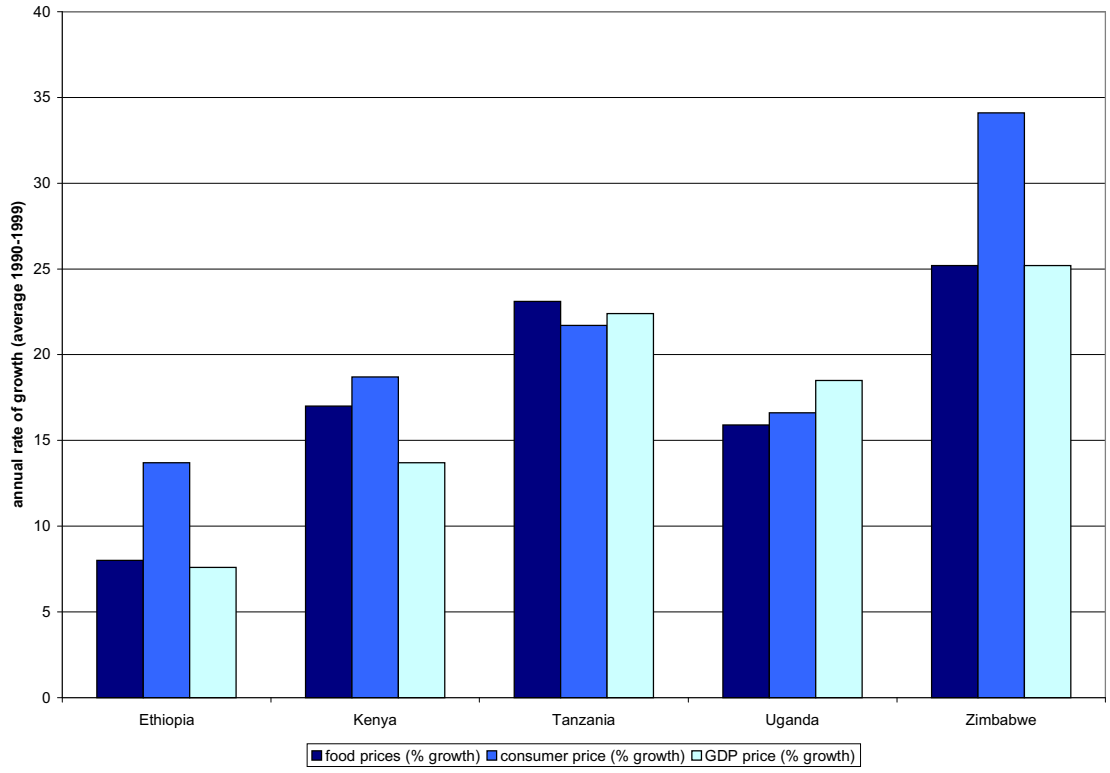
A stable macro economic environment is an important determinant of investment and economic growth, and this also applies to the coffee sector. Industry and agriculture both benefit from low inflation rates, low interest rates and a balanced development of the exchange rate. Table 1 summarises GDP, per capita GDP and poverty of the five countries. Zimbabwe and Kenya have a substantially higher aggregate welfare in terms of GDP (1996), while the other countries are more or less on the same level. In the 1990s GDP growth is highest in Uganda with an annual average of close to 7%, while GDP growth in Ethiopia come in second place with an annual average of close to 5%. GDP growth Kenya, Tanzania and Zimbabwe is in the range of 2%-3% annually. It is almost certain that developments in Zimbabwe since 1998 will have affected GDP adversely but there are no data available for these years. Per capita GDP offers an indication of the average standard of living in the country. From Table A2 it is observed that per capita GDP is highest in Zimbabwe. With around $300 both Tanzania and Uganda are in the middle while Tanzania, and particularly Ethiopia are at the lower end, with a stunningly low per capita income of slightly above $100. Population under the poverty line is only available incidentally on the basis of survey material, mainly from so called World Bank Poverty Assessments. The figures in the table give the share of the population below the poverty line (head count), for the most recent years (that, however, may differ by country, see table). It is clear that all countries suffer from dramatic poverty. According to the World Bank's Poverty Assessments, the rural component of poverty is larger than the urban component. There is no published information on the specific incidence of poverty among coffee growers.

Table A2 GDP per capita and poverty

	Ethiopia	Kenya	Tanzania	Uganda	Zimbabwe
Gross Domestic Product*, x 1,000,000 US$	5974	9245	6496	6344	8476
Gross Domestic Product*, average annual growth in %	3.8	1.9	2.9	6.9	2.6
Gross Domestic Product per Capita (1995 US$)	111.3	313.8	185.8	292.1	683.6
Population below the poverty line (%)*	45.5	52.0	51.1	35.2	47.2

* Source: IFS/IMF, average 1990-1999, constant 1995 US$; ** Source: various World Bank publications; Ethiopia: 1995/96; Kenya: 1997; Tanzania: 1991; Uganda: 1999-2000; Zimbabwe: 1996

Figure A1 Inflation according to various measures*



Source: WDI2001
* annual average for the period 1990-1999

High inflation has an adverse effect on the economy and on economic growth. It pushes up transaction costs, causes distorted relative prices, increases uncertainty and, as a result, lowers investment. Realising moderate rates of inflation is a major macro economic policy goal and is a major component of good macroeconomic management. Figure A1 shows several measures of inflation, in particular food prices, consumer prices and GDP. Both consumer prices as well as GDP may reflect an element of increase in prices due to import of goods and services and, hence, to devaluation of the domestic currency. Food is usually to a larger extent produced domestically and will be less (or only indirectly) influenced by import prices. This is, however, only supported with Zimbabwean consumer prices. Average inflation (1990-1999) is highest in Zimbabwe and ranges from 25%-34%. In Tanzania it is slightly above 20%, while it is around 15% in Kenya and Uganda. In Ethiopia it is lowest with values around 10% annually.

Table A3 Interest rate and credit*

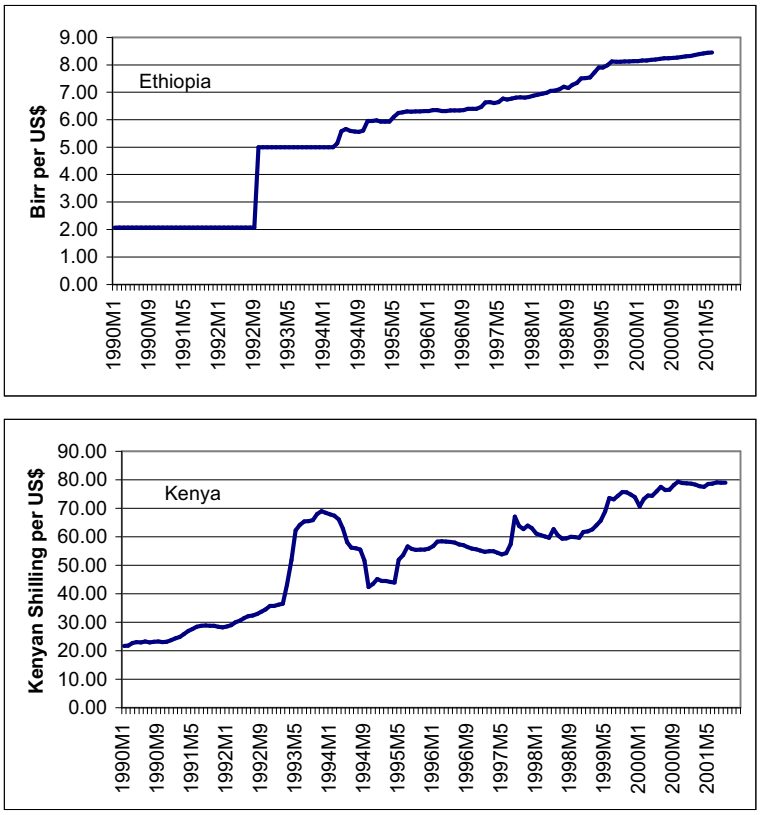
	Ethiopia	Kenya	Tanzania	Uganda	Zimbabwe
lending rate (nominal)	10.9	27.0	31.1	25.3	31.7
real interest rate	3.3	12.0	8.3	10.0	5.5
credit to private sector (in % of GDP)	22.6	33.0	8.0	4.9	30.3

Source: WDI2001
* annual average for the period 1990-1999

Interest rates are important as these rates determine both cost and availability of credit. Real interest rates presented in Table A3 are lowest in Ethiopia (3.3%) and Zimbabwe (5.5%), while these rates are on a substantial higher level, ranging from 8% to 12% annually in Kenya, Uganda and Tanzania. Both Zimbabwe and Ethiopia have experienced negative real interest rates in the beginning of the 1990s causing a drop in the supply of credit from 1991-1993. Credit to the private sector is on a low level in Uganda (5% of GDP) and Tanzania (8% of GDP), while credit to the private sector is of a substantially higher order of magnitude in Kenya and Zimbabwe (30%-33% of GDP). Note that Zimbabwean data are not available from 1998 and the figure in the table hence does not reflect the recent developments.

The evolution of the exchange rate is crucial for commodity exporting countries, in view of export earnings, and for farmers who earn an income from producing these commodities. A depreciation (or devaluation) of the domestic currency increase the domestic currency value of US dollar denominated world market prices of coffee, and this allows coffee growers and exporters to compete more effectively on the world market or to increase their revenues in domestic currency. An appreciation of the domestic currency, or an overvalued currency does the reverse creating a burden on domestic coffee growers and exporters.

Figure A2 Exchange rate development



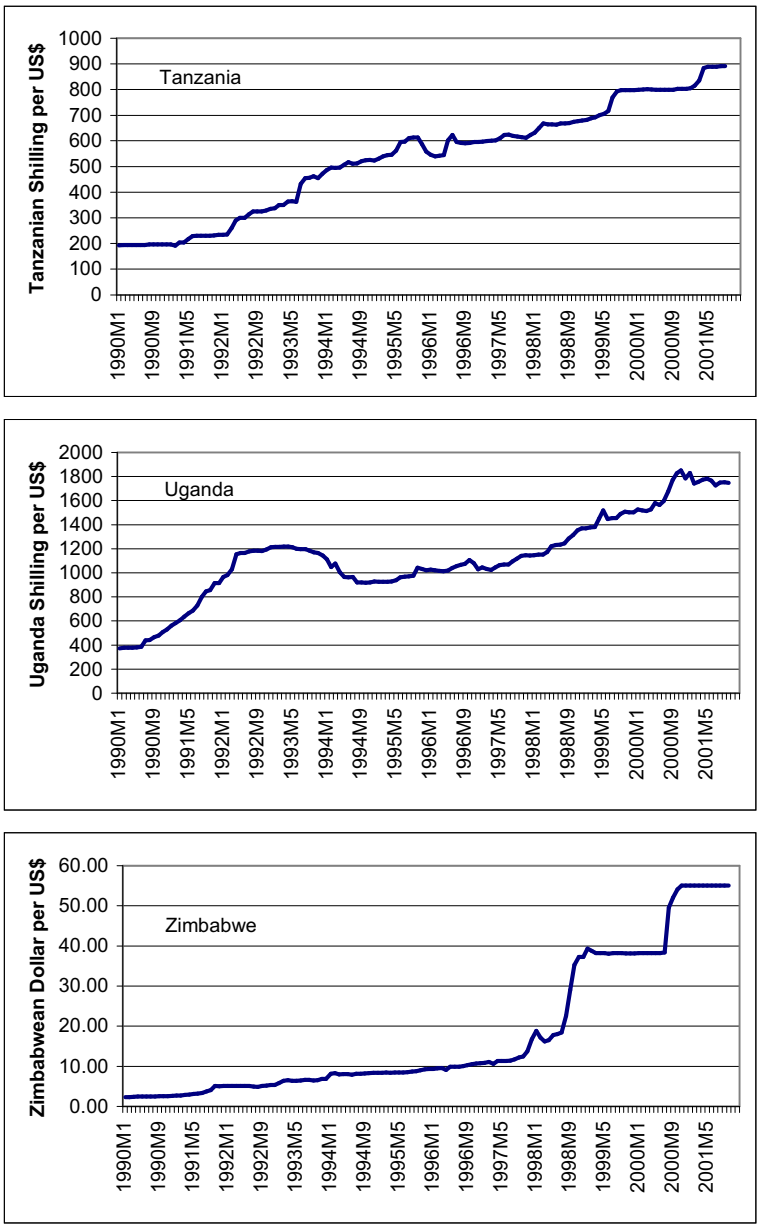
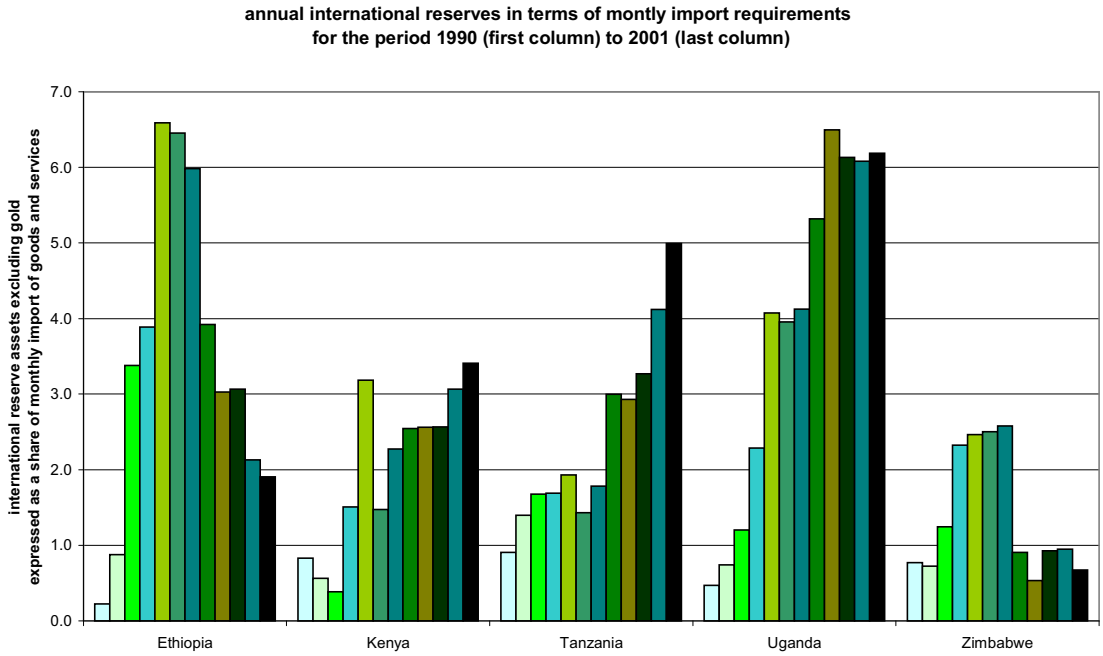


Figure A2 summarises the exchange rate development of the five countries in the 1990s. See Section 3.5 for further details and comments.

International trade requires maintenance of a stock of international reserves to support a smooth operation of the international transaction. A stock of international reserves in excess of three months of imports is usually regarded as reasonable and sufficient to avoid foreign exchange crises. Figure A3 shows the development of the stock of international reserves, expressed as a share of the monthly imports of goods and services. Kenya, Tanzania and Uganda show continuous improvement over the 1990s: Tanzania and Kenya experience a stable development that is improving slightly over the 1990s, while Uganda is performing well since 1993 with international reserves of around six months of imports. Ethiopia shows a clear and substantial improvement halfway the 1990s with international reserves of five months of import, presumably due to high coffee prices during these years. In the last part of the 1990s, however, Ethiopia experienced a deterioration of its external reserve position. Zimbabwe is clearly in a

critical position, with international reserves of generally less than one month of imports, except for a number of years halfway the 1990s.

Figure A3 International reserves

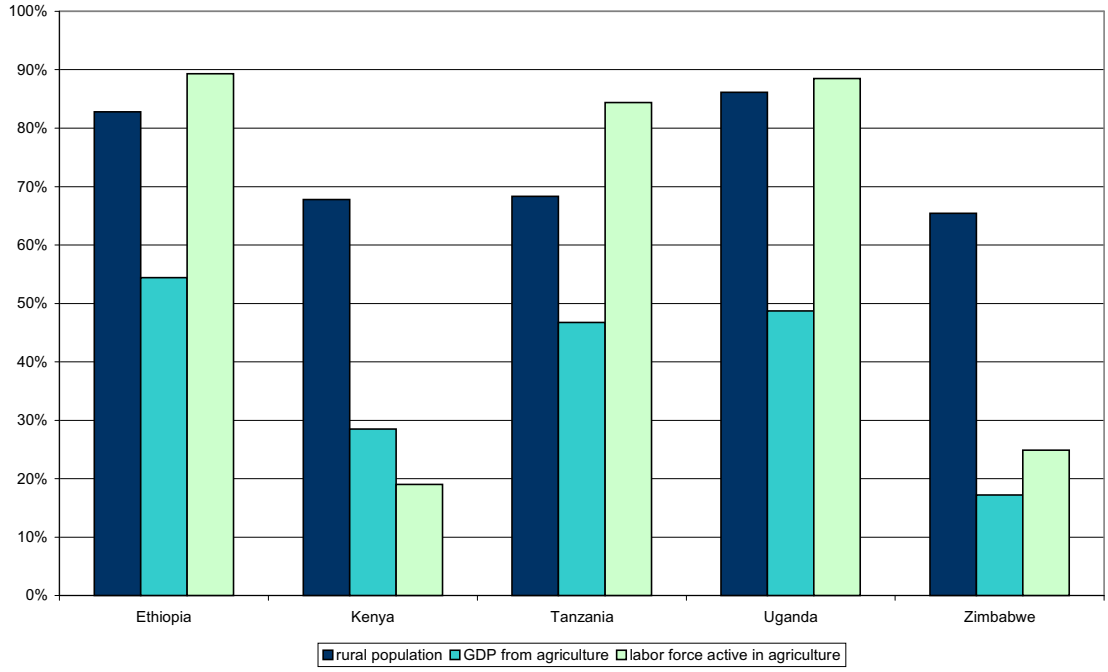


Source: WDI2001

As the objective of this study is to evaluate the possibilities to offer coffee farmers and co-operatives markets based instrument to protect their revenues against price fluctuations, it is necessary to look at the agricultural sector in the various countries, its contribution to GDP, its employment and its productive potential. In Figure A4 the position of agriculture in the various economies is analysed in some detail. The share of the rural population is larger in both Uganda and Ethiopia compared to Kenya, Tanzania and Zimbabwe. Turning to the urban population, Nairobi, Addis Ababa, Dar es Salaam, Harare and Kampala have, respectively, 2.4 million, 2.6 million, 2.5 million, 1.7 million and 1.2 million inhabitants (all data refer to 1998). Zimbabwe is the most, and Ethiopia the least urbanised of the five countries we consider.

Ethiopia, Uganda and Tanzania may be characterised as agrarian societies with a share of GDP originating from agriculture in the range of 45%-55% and a share of the labour force active in agriculture of more than 84%. Kenya and Zimbabwe are different in this respect with respectively 29% and 17 % of GDP originating from agriculture, and less than 25% of the labour force active in agriculture.

Figure A4 Rural versus urban, agricultural GDP and labour force*



Source:WDI 2001;
* annual average for the period 1990-1999
** WDI 2001, based on surveys in various years

Table A4 summarises further information of the agricultural sector. The absolute size of arable land is largest in Ethiopia (> 10,000 ha) and smallest in Zimbabwe (> 3,000 ha), which is not surprising given the relative size of this country. The share of arable land is largest in Uganda (25%) and smallest in Tanzania (4%). Arable land per person is largest in Zimbabwe and Uganda (around 0,280 ha), while it is in the range of 0.13 and 0.18 ha in the other countries. Average value added in constant prices is highest in Ethiopia, but again this is due to the size of Ethiopia, while it is smallest in Zimbabwe. Annual growth of the agricultural sector is highest in Uganda (3.8%) and Zimbabwe (5.4%), while it is lowest in Kenya (1.3%).

Table A4 Agriculture: arable land and value added*

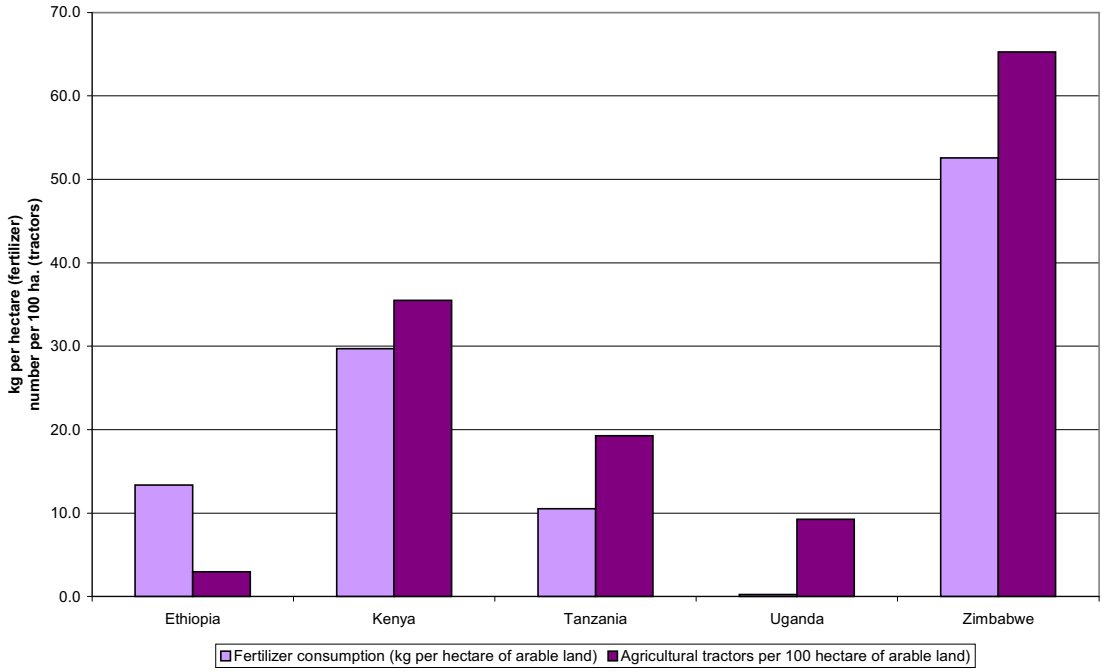
	Ethiopia	Kenya	Tanzania	Uganda	Zimbabwe
arable land x 1,000 ha	10062	4000	3666	5044	3061
arable land: share in %	10.1	7.0	4.1	25.3	7.9
arable land per person	0.176	0.153	0.128	0.273	0.285
value added in agriculture (x1000000 constant 95 US$)	2894	2405	2256	2537	1069
value added in agriculture (annual growth in %)	2.5	1.3	3.2	3.8	5.4

Source:WDI 2001;
* annual average for the period 1990-1999

Value added in agriculture is realised with differing levels of inputs across these five countries. The use of inputs, and the extent to which inputs are used in agriculture are potentially interesting for commodity risk management. They may indicate possible channels for delivering

commodity risk management instruments to farmers, but the extent of input use also is a measure of capitalisation of the agricultural sector and the use of credit and credit arrangements in agriculture. In Figure A5 two specific measures of input use - use of fertiliser and agricultural tractors in the agricultural sector - are shown. The figure clearly underscores the marginal penetration of inputs in Ethiopia, Tanzania and Uganda and the relatively high degree of fertiliser and tractor use in Zimbabwe, and to a lesser extent in Kenya.

Figure A5 Input use in agriculture: fertilizer consumption and use of agricultural tractors*



Source:WDI 2001;
* annual average for the period 1990-1999

A3 Infrastructure quality: transportation, communication and the impact of liberalisation

Coffee production and the feasibility of price risk management in coffee are related to infrastructure of the country. The size of the country and the size of the population are important for coffee production as these are determinants of transportation costs and availability of land and labour. The road and railroad network and the available trucks and trains, or in short the supply of transportation services also determines transportation costs. A good road infrastructure facilitates the marketing of coffee. Good communication infrastructure promotes adequate dissemination of price information and distribution of cultivation expertise and supports efficient trading. Different ethnic groups in the society and related diverging interests may complicate communication, exchange of information and good trade relationships.

As mentioned above, the road and railroad network and the available trucks and trains, or in short supply of transportation infrastructure determines transportation costs. A good road infrastructure facilitates the marketing of coffee, but also the distribution of inputs and supporting services. Hence, transportation infrastructure (or the lack of such an infrastructure)

will influence the basis of coffee prices between main export location, domestic trading centre(s) and local production centres. The costs arising out of a poor infrastructure are not evenly distributed between farmers and exporters: transport from the production location to domestic trading centres - usually more difficult due to less developed infrastructure - is on account of the coffee grower, while transport from the domestic trading centre to the main export location - usually less difficult due to comparatively better roads - is on account of the exporter. In Ethiopia coffee for export is transported by truck from Addis to Djibouti, on a relatively new road. However, the overall road network in Ethiopia is poor: around 75% of farms are inaccessible during the rainy season due to lack of all weather roads and this problem is particularly acute in the rainy season from March to August (see ICO/CFC, 2000)[32]. Hence transport from growing areas to Addis will be much more problematic. Karanja (2002) reports, on the basis of survey among Kenyan coffee farmers in the Central Province, that access to local markets was realised by 48% of the households via ungraded roads that are often impassable during the rainy season, by only 28% of the households via tarmac roads, and by 23% of the households via graded roads. It should be noted that Central Province in Kenya has a reasonably well developed road network compared to other regions. With an average distance to the nearest local market of 4 km and a per kilometre cost of transporting a bag of coffee of 15-60KSh. transportation costs are far from negligible. And apparently, even the proximity of tarmac roads does not prevent costs of transportation to coffee farmers to be considerable.

Table A5 Infrastructure: geography and transportation

	Ethiopia	Kenya	Tanzania	Uganda	Zimbabwe
landlocked	yes	no	no	yes	yes
main export location	Djibouti	Mombasa	Dar es Salaam, Tanga	Mombasa	
seaport used for export	(Djibouti)	Mombasa	Dar es Salaam	(Mombasa)	()
major coffee area	Southwest, south and east of the country	North and north-east of Nairobi	West of Lake Victoria, Kilimanjaro	West, south and south-west of the country	South-east along the Mozambique border
Major coffee market		Nairobi	Moshi	Kampala	
distance between coffee area and seaport in km.					
roads in km per sq km area	0.026	0.111	0.084		0.235
quality of road network	poor				
railroads in km per sq km area					
quality of railroad network					

Source: WDI2001, ICO, and others

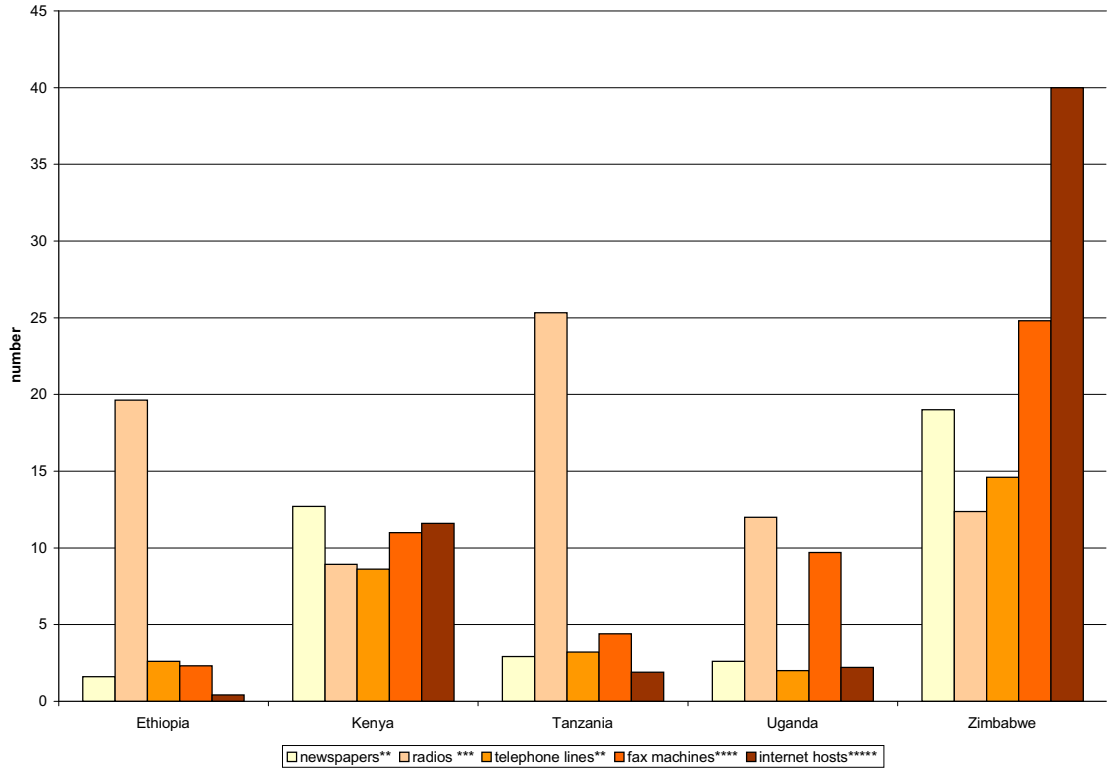
Also geographical issues like the location of the coffee areas relative to the main export centres, and whether a country is landlocked are important.

Communication is important to the functioning of markets. A well-developed communication infrastructure allows quick and adequate exchange of information, and

[32] The washed coffee is marketed from November to March with a peak from February to March, while the sun-dried coffee is marketed throughout the year.

promotes efficient decisions of market participants. Hence, the degree of development of the communication infrastructure often goes hand in hand with the degree of competitiveness of markets. Dissemination of prices would be important contribution of the communication infrastructure as far a coffee is concerned. Growers receive price information from the international media, in particular the BBC World Service: this underscores the importance of radios. In Figure A6 a number of indicators are reported reflecting the degree of development of the communication infrastructure. Zimbabwe and Kenya score relatively high in terms of newspapers, telephone lines, fax machines and internet hosts. At least in Kenya this appears to be concentrated in the urban areas and not in the rural areas. Survey evidence (see Karanja, 2002) indicates that price information is obtained by almost 50% of all households through traders and through neighbours. Communication infrastructure in the other countries is less developed, with the exception of the number of radios which is particularly high in Ethiopia and Tanzania. In Ethiopia growers are informed about international prices through daily radio broadcasts conducted by the Coffee and Tea Authority. The prevalence of radios in Ethiopia (and Tanzania) as a means of dissemination of information may also be explained to some extent by illiteracy: the illiteracy rate is highest in Ethiopia (67.3%)[33], substantial in Tanzania and Kenya (30.6% and 38.8%) and lowest in Kenya and Zimbabwe (23.6% and 15.6%).

Figure A6 Dissemination of information: newspapers, radio, telephone lines, fax machines and internet hosts*



Source:WDI 2001;
annual average for the period 1990-1999; ** per 1000 people; *** per 100 people; **** per 100,000 people; ***** per 1,000,000 people

[33] The illiteracy rate is defined as % of illiterate people aged 15 and above. Data are annual averages over the period 1990-1999 and are taken from WDI 2001

Annex B Organizations Visited and Persons Interviewed

Kenya, Monday, 11th March 2002

Kenya Planters' Cooperative Union, Nairobi (KPCU)

Stephen Kirubi (Chairman), George A. Kiraithe (Vice-Chairman), Ruth Mwaiki (General Manager), Mirie Mwangi (Lecturer, Department of Accounting, Nairobi University), Roland Meier (Chief Technical Officer, CFC Projects, UNOPS), George Kayura Mchaira (Field Services manager), Julius Kamao (Finance Officer), Nicholas Ngeru (Public Relations Manager), James Muniye (Administrative Officer)

Kiamara Estate, coffee area north of Nairobi (Kiambu)

J.Karigu (Estate Manager, former attorney general), Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU), Julius Kamau (internal auditor, KPCU), M.Mwangi (lecturer, Nairobi University)

Kiambu Institute of Technology, Riara

J. Mungai (Estate Manager), Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU), Julius Kamau (internal auditor, KPCU), M.Mwangi (lecturer, Nairobi University)

Thiririka Farmers Cooperative Society

J. Karara (chairman), J. Gathuku (vice chairman), D.Njihia (honorary seceretary), H. Zeff (treasurer), M. Wanjiru (secretary manager), J. Nbiri, H. Karanja, P. Kiragu (members), Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU), Julius Kamau (internal auditor, KPCU), M.Mwangi (lecturer, Nairobi University)

Kenya, Tuesday, 12th March 2002

Servicoff Limited (export comapany), Nairobi

P.K. Kinyua (GM), Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU), Julius Kamau (internal auditor, KPCU)

Nairobi Coffee Exchange, Nairobi (NCE)

Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU), Julius Kamau (internal auditor, KPCU)

Kenyan Railways, Nairobi

Mr. J.O.A Nyerere (personal assistant to managing director), Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU), Julius Kamau (internal auditor, KPCU)

KPCU mill, Nairobi

Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU)

Kenya, Wednesday, 13th March, 2002

Coffee Board of Kenya, Nairobi

Ashford M. Miriti (General Manager), Simeon Onchere (Deputy General Manager)

Kenya Commercial Bank, Nairobi

K.W. (Wilson) Mwangi (Head of Trade Finance), Lynette A. Dawa, Manager (Special Loans Unit), Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU), Julius Kamau (internal auditor, KPCU)

Cooperative Bank of Kenya, Nairobi

Mrs. Dorcas W. Rigathi (Manager, SCIP), Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU), Julius Kamau (internal auditor, KPCU)

Coffee Research Foundation, Nairobi

Mr. Gitongha (),Karugu Macharia (Field Services Manager, KPCU), Nicholas Ngeru (publicity manager, KPCU)

Uganda, Thursday, 14th March, 2002

National Advisory Council, Kampala

Apollo Kamugisha (CFC/WHRS), Roland Meier (UNOPS) and others

Ugandan Coffee Development Authority, Kampala (UCDA)

Apollo T. Kamugisha (Integrated Commodity Marketing Systems), Kiguma Abdul (Director, Star café Ltd), John M. Byarugaba (Head, Technical Unit, UCDA), Henry Ngabirano (Managing Director, UCDA), Telis Nicolaides (Managing Director, Great Lakes Coffee Company Ltd), Joseph M. Nkandu (National Coordinator, Uganda Coffee Farmers' Association)

Uganda, Friday, 15th March, 2002

East African Development Bank, Kampala

George G. Ng'anga (Director Busines Development), Mary Gumisiriza (manager corporate finance), Apollo Kamugisha (CFC/WRS)

Centenary Rural Development Bank, Kampala

James L. MacDade (Banking Advisor – Credit, Bannock Consulting), Apollo Kamugisha (CFC/WRS)

Stanbic Bank, Kampala

Chris Baine (Relationship Manager, Trade Finance), Kailash Giri (Treasury Manager), Geoff Solomon (General manager Corporate Banking Services), Apollo Kamugisha (CFC/WRS)

Allied Bank, Kampala

Cotton Development Organisation (CDO), Kampala

Mrs. Jolly K. Sabine (Managing Director, CDO), Kandarp Kinariwalla (Southbase Agro Industries Ltd), Hitesh Panchmatia (Managing Director, Bon Holdings Ltd), Mr. Hans Muzoora, Apollo Kamugisha (CFC/WRS)

Uganda, Saturday, 16th March, 2002

Agribusiness Development Centre (ADC)

Mark Wood

Kibinge Coffee Farmers Group, Masaka

Mr. Joseph Mkandu (national coordinator, Uganda Coffee Farmers Association), Apollo Kamugisha (WRS/CFC)

Tanzania, Monday, 18th March, 2002

Postal Bank, Dar es Salaam,

A.R.Kihwele (managing director)A.M. Mtandika (Chief of Credit), M.P.B. Luzinge (Credit Manager), Elizabeth Kimambo (WRS/CFC)

Standard Chartered, Dar es Salaam

Mwijage Bishota (Manager, Commodity and Structured Trade Finance), Alex Kwayu (Credit Officer, Commodity and Structured Trade Finance), Elisabeth Kimambo (WRS/CFC)

Ministry of Cooperatives and Marketing, Dar es Salaam

Mohamed Said Muya (Acting Director, Financial Services), D.P. Miya, Elizabeth Kimambo (WRS/CFC)

Tanzania, Tuesday, 19th March, 2002

Management of CFC Warehouse Receipt Scheme, Dar es Salaam,

Elizabeth Kimambo (Project Coordinator, CFC/WRS), Fidelis J. Temu (Coordinator for Coffee)

National Bank for Commerce, Dar es Salaam

Kuringe J.E. Msoma (Manager, Corporate Credit, Elisabeth Kimambo (CFC/WRS)

Cooperative Rural Development Bank (CRDB), Dar es Salaam

Paul Obette (Credit Manager)

Stanbic, Dar es Salaam

Hubert Mengi (Chief Manager, Corporate Services), Angelus Teruka (Manager, International Trade Centre), Elisabeth Kimambo (CFC/WRS)

Tanzania, Wednesday, 20th March, 2002

Tanganyika Coffee Curing Co. Ltd. (TCC), Moshi,

Zebadiah S. Moshi (General Manager), Julius S. Arope (TCB)

Kilimanjaro National Cooperative Union

Raymond Kimaro (general manager), Raymond Mushi (finance manager), Onesmo Mwanxi (chief internal officer), Tobias Masaki (administrative manager), Julius S. Arope (TCB)

Kilimanjaro Cooperative Bank (KCB), Moshi

J.M.K. Kullayar (General Manager), Julius S. Arope

Tanzania, Thursday, 21th March, 2002

Moshi Coffee Auction, Moshi

Tanzanian Coffee Board (TCB), Moshi

Leslie D. Omari (Managing Director), Frederick S. Mpangile (Director of Planning and Operations), Rehema Nyiti (Procurement Officer), Melkiad Massame (Procurement Officer)
Tanzanian coffee exporters, Moshi (at MCA)
Unni Krishnan (DP & A Manager, Mazao Ltd (Neumann)), Tahseel M. Sheriff (Tahseel M. Sheriff), Kavita Vohora (Director, Coffee Exporters Ltd.), Vincent M. Shirima

Tanzania, Friday, 22th March, 2002

Mlimani Rural Cooperative Society, Babati

Mr. Wiwirkim Shayo (chairman), Mr. Ayubu K. Kirika (secretary), Mr. Paulo S. Amari, Mr. Archibald Lyimo,

Ethiopia, Thursday, 11th April, 2002

Coffee & Tea Authority, Addis Ababa

Tsegaye Berhane (General Manager), Aster Estafanos (Head Planning and Programming)

Ethiopian Coffee Exporters' Association, Addis Abbaba

Getinet Kelkle (Secretary General)

Ethiopia, Friday, 12th April, 2002

Ambassa Enterprise Plc, Addis Abbaba

A.M. Mr Wetherell (chairman)

Ethiopia, Monday, 15th April, 2002

Coffee Auction, Addis Abbaba

Temesgen Ejeta (administrator Coffee Processing and Warehouse Enterprise (CPWE))

National Bank, Addis Abbaba

Samuel Mulugeta (Officer Economic Research Division), Yohannes Ayalew (Deputy Director, Economic Research Department)

The State Minister for Trade

Fantaye Biftu

Commercial Bank, Addis Abbaba

Yilma Abebe (Head of the Export Department), Yelebe Molla (Manager Project Finance).

SA Bagersh Plc, Addis Abbaba

Mr Abdullah Bagersh (General Manager)

Oromia Coffee Farmers' Cooperative Union (OCFCU)

Dessalegn Jena (Export Manager), Tadessa Meskala (General Manager)

Kenya, Tuesday, 2nd July, 2002

Kenya Planters' Cooperative Union, Nairobi (KPCU)

George A. Kiraithe (Vice-Chairman), Roland Meier (Chief Technical Officer, CFC Projects, UNOPS), George Kayura Mchaira (Field Services Manager), Julius Kamao (Finance Officer), James Muniye (Administrative Officer)

Zimbabwe, Wednesday, 3rd July, 2002

Coffee Growers Association, Harare, Zimbabwe

T. Fennell (Chairman, Coffee Growers Association), Jules Lang (CEO, Coffee Growers Association), K. Ndoro (Senior Agricultural Economist, Commercial Farmers Union), S. Gwaringa (ZFU), D. Muganyura (ZFU), I. Goggin (ZIMACE), N. D. Brown (Commercial Cotton Growers Association), M. Bragge (Commercial Cotton Growers Association), V.Ndlovu (African Banking Corporation), T. Moyana (Barclays Bank of Zimbabwe), E. Katanda (Kingdom Merchant Bank), B. Washama (NMB Bank), K. Mangana (Stanbic Bank), G. Giles (Standard Chartered Bank), D. Hale (Standard Chartered Bank)

Zimbabwe, Thursday, 4th July, 2002

Zimbabwe Coffee Mills, C.J.Taffs, Fiona McDonald

Zimbabwe, Friday, 5th July, 2002

Arda Resettlement Scheme

T. Fennell (Chairman, Coffee Growers Association), Dagmore Tawonezvi (Coffee Market Development and Trade), Dumiasani Kutywayo (Coffee Research Station), Julius Mathende (Ministry of Lands & Agriculture), David Muganyura (ZFU), Samson Mudawose (farmer), Solomon Masuka (farmer), Daniel Mabori (farmer), Farai Maseure (farmer), Sari Runondo (farmer), Joseph Mapuya (farmer), Kenneth Simango (farmer), Cephus Sithole (farmer), Knife Matyebadza (farmer), Phibion Mugobo (farmer), Timothy Simango (farmer), Mudzunoairi Mubaiwa (farmer), Alex Chinoza (farmer), Phineus Banda (farmer)

Annex C Foreign Exchange Regulation

Kenya

Kenya states that it welcomes foreign investment. All business activities are open to foreign investors. Only the insurance industry requires any Kenyan co-ownership. Agricultural land may only be held by Kenya citizens. There are no exchange control restrictions. The Central Bank is responsible for supervision of the currency. Residents may hold foreign currency accounts. Foreign exchange for eligible transactions is purchased from the commercial banks without any control. Eligible transactions include payments in respect of dividends, capital and interest on loans, current account transactions and proceeds on disposal of investments. There are no controls on foreign exchange rates. Legislation pegging interest rates on loans and overdrafts and on deposit rates, to the Central Bank of Kenya Treasury Bill rates was drafted during 2001, but is the subject of challenge by the banking industry through the courts and is also under review by legislators. Exchange rates are driven largely by supply and demand. There are notification requirements for remittance of large sums in foreign currency.

Tanzania

In 1992 the stringent foreign exchange legislation was repealed and the restriction on foreign commercial banks abolished. Any person whether resident or not may establish foreign currency accounts with any of the commercial banks and transfer foreign currency outside Tanzania without restriction. The Bank of Tanzania regulates commercial banks and approves the establishment of offshore foreign currency accounts by residents. There are no controls on foreign exchange rates or interest rate on loans and overdrafts.

Generally, banks and bureaux de change play a major role as both dealers and intermediaries in a country's foreign exchange market. Usually, the foreign exchange market is understood to mean dealing, mostly by telephone, in foreign currency balances. The relationship between supply and demand in the foreign exchange market determines the exchange rate for foreign currencies, which is expressed in terms of local currency units for one (a hundred or a thousand) unit(s) of the foreign currency. Depending on the contractually agreed point of time at which a foreign exchange deal is to be settled, a distinction is drawn between spot and forward transactions. Spot transactions are those which have to be performed immediately, i.e., within a period of two days, while transactions to be performed later are forward transactions. The rates at which spot and forward transactions are concluded are spot and forward rates, respectively.

The Bank of Tanzania gradually eased foreign exchange controls after the enactment of the Foreign Exchange Act of 1991, by allowing the establishment of foreign exchange bureaux in April 1992, introducing foreign exchange auctions in July 1993, and creating the Interbank Foreign Exchange Market (IFEM) in June 1994.

The foreign exchange market in Tanzania is composed of the wholesale and retail markets. The IFEM is the wholesale market, which plays an important role in the determination of the country's official exchange rate and the provision of funds for the accumulation of international reserves. The main objectives of the IFEM are:

a) to allow banks and other authorised dealers to play an active role in developing markets and instruments to serve their customers;

b) to increase the efficiency in the allocation of foreign exchange reserves, thereby facilitating market-determined exchange rates;
c) to create a favourable environment for foreign investment, which would, ultimately, pave the way to full liberalisation of the capital account; and
d) to improve the conduct of monetary policy

Initially, the IFEM was conducted on an open outcry basis, whereby authorised dealers assembled in the BOT auditorium. The BOT supervised the daily sessions by inviting offers and bids, and awarding deals at the highest bid. Telephone dealing was introduced in May 1996 and authorised dealers are considering to introduce electronic dealing in the foreseeable future.

The retail market, in which individuals and businesses satisfy their foreign exchange requirements, is catered for by bureaux de change and banks.

Tanzania's trade and exchange system is now completely free of restrictions on making payments and transfers for current account transactions. The Government has already accepted the obligations of Article VIII of the IMF's Articles of Agreement, in order to boost the country's attractiveness for foreign investors.

Source: Bank of Tanzania, http://www.bot-tz.org/

Uganda

With the removal of controls on the Capital Account in July 1997 allowing free movement of capital in and out of the country, Uganda has a fully liberalised foreign exchange regime. Foreign currency can be freely traded at licensed forex bureau. There is no restriction on repatriation of dividends or entry of capital.

Zimbabwe

Exchange controls have in principle been substantially liberalised. Dividend remittances are allowed at 100% of current after tax revenue profits. Capital is blocked and may be remitted through 20 year 4% government bonds, denominated in Zimbabwe dollars. Capital is paid in 10 equal annual instalments at the end of years 11 to 20. Interest is 4% per annum, tax free and payable half yearly.

Source: http://www.mbendi.co.za/werksmns/lexaf/

Zimbabwe currently operates an unofficial dual exchange rate policy with the offical rate many times higher than the market rate. Exports can normally be negotiated at an intermediate "blended rate", but imports will almost always be at the massively over-valued official rate.

Foreign capital inflows

Foreign investors and visitors may bring an unlimited amount of foreign currency into the country. Foreign investors may bring equity into the country in the form of cash or machinery and equipment. Foreign investors are not permitted to capitalize, as part of equity, the following:

- Raw materials
- Technical and licensing fees
- Other services

Repatriation of investment

The Zimbabwean Government guarantees the repatriation of 100% of the original capital

- Iinvestment in the case of divestment.
- 100% of dividends from net after tax profit may be remitted.
- Investors who become permanent residents may not remit their dividends without prior
- Approval of the Exchange Control authorities.

In practice, these provisions are undermined by the requirement that any repatriation be at the official exchange rate.

Foreign Currency Accounts

Corporate and individual foreign currency accounts may be opened with local commercial banks. Export proceeds are eligible for credit to a corporate foreign currency account but unutilized amounts are required to be drawn-down into local currency after 60 days. Individual foreign currency accounts are unaffected by this requirement. In practice, Zimbabweans hold any foreign currency offshore.

Borrowing

Local: No restrictions on local borrowing for working capital.

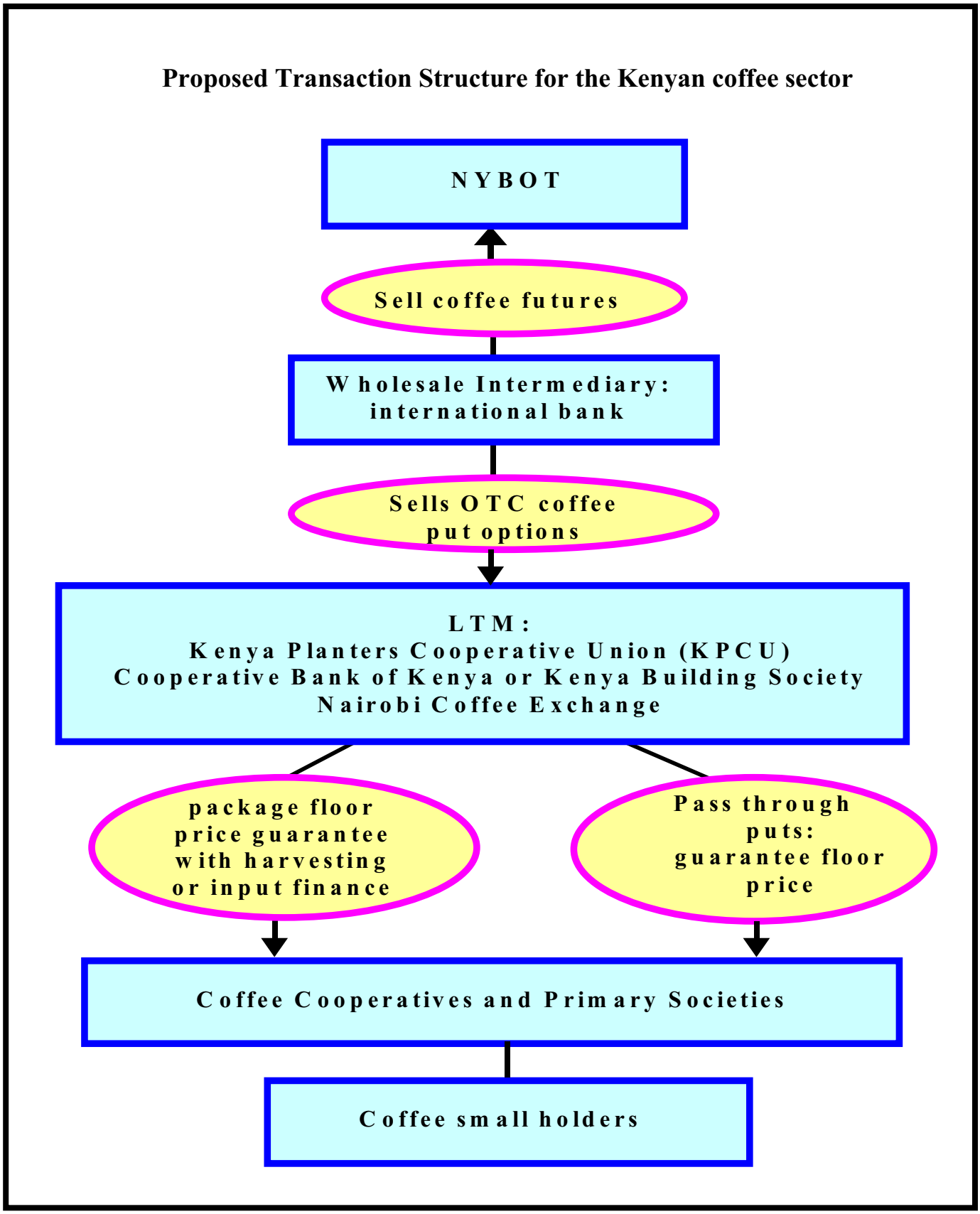
Foreign: All companies operating in Zimbabwe are free to borrow offshore provided such loans are transacted through an authorized dealer. External loans exceeding US$5 million require central bank approval.

Financing of capital projects can only be undertaken using funds injected from outside of Zimbabwe, or by utilizing retained earnings.

The actual practice is therefore almost the exact opposite of the principles of the foreign exchange legislation – it is very difficult to obtain foreign exchange, and a vast amount of time is spent by exporters in negotiating conversion of revenues at the blended rate. This position is unlikely to change while Zimbabwe maintains its current unofficial dual exchange rate regime and the associated over-valuation of the Zimbabwean dollar.

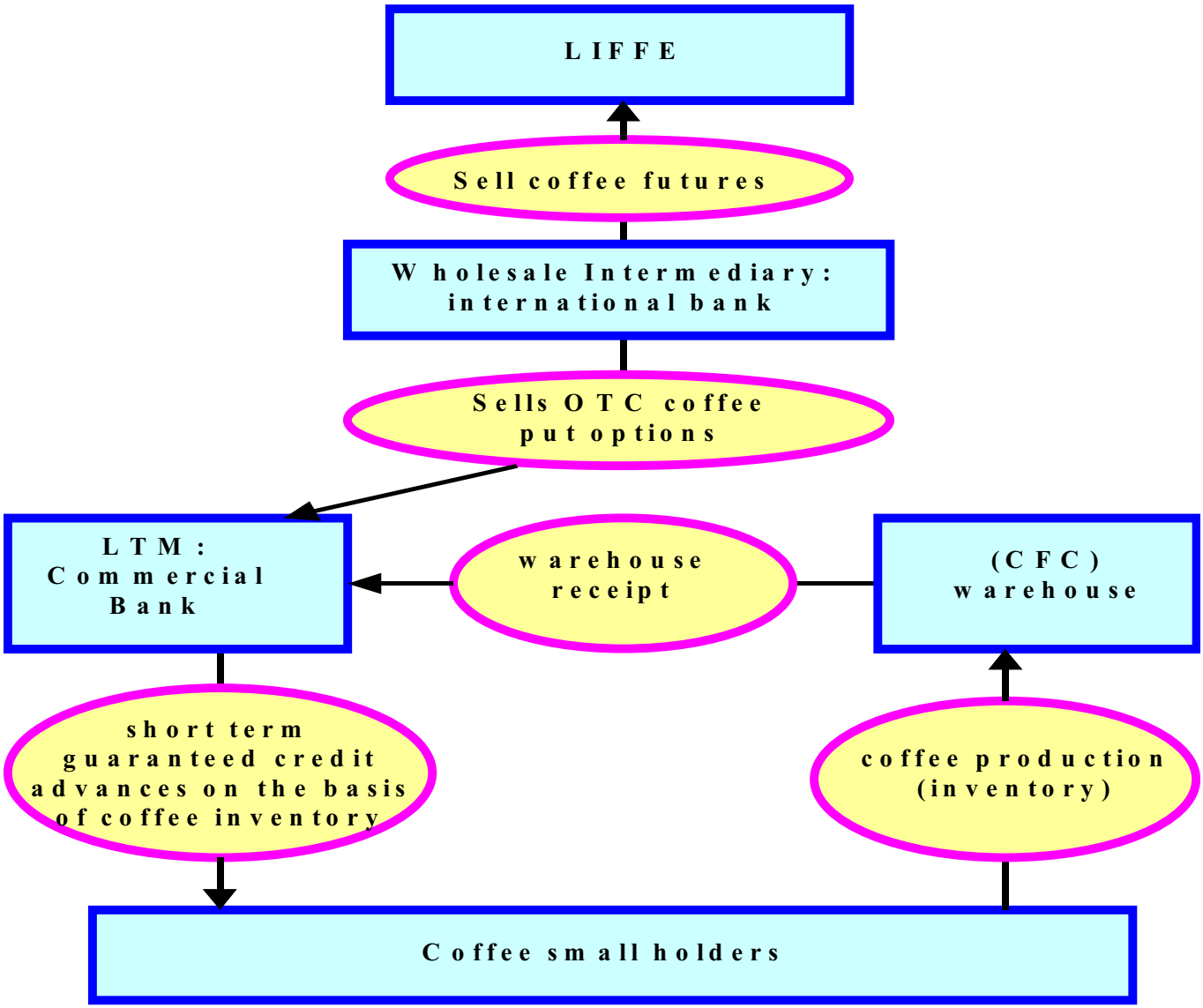
Source: Zimbabwe Investment Centre, www.zic.co.zw

Annex D Proposed Transactions



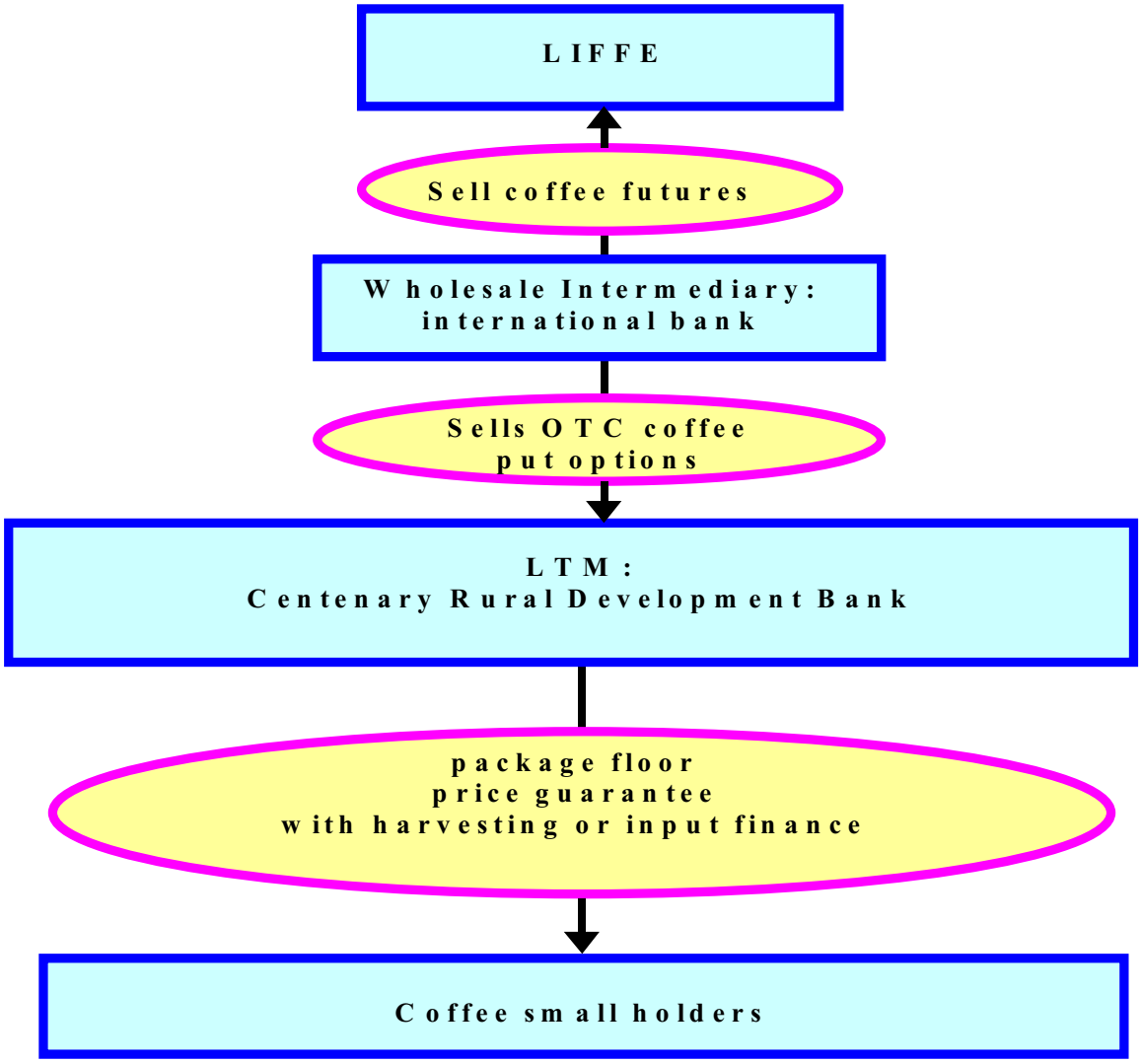
Proposed Transaction Structure for the Uganda coffee sector:

short term credit to coffee small holders with price guarantees (price risk management) and volume guarantees (CFC warehouse receipt scheme)



Proposed Transaction Structure for the Uganda coffee sector:

floor price guarantees
with harvesting finance of input finance
for coffee smallholders



Annex E Proposal for Pilot Project on Price Risk Manageme nt in Kenya

Logical Framework
(see end of this Annex)

Project Summary
The proposal set out below follows the document CFC/EB/31/2 approved by at the 31st Meeting of the Executive Board, Amsterdam, 23-25 April 2001.

Project Title:
Market Based Price Risk Management to Kenyan Coffee Farmers and Co-operatives

Duration:
3 years

Location:
Kenya

Nature of Project:
Insurance of price risks for coffee cooperatives and hence smallholder coffee farmers

Brief description:
The project will facilitate the provision of price insurance to coffee cooperatives, in order to increase revenue certainty for coffee smallholders, and in order to increase access to credit to coffee cooperatives and coffee smallholders. It also aims at increasing the volume of turnover of domestic traders and exporters. These objectives will be achieved by transactions between cooperatives and the Cooperative Bank of Kenya / KPCU (the retail transaction), and transactions between the Cooperative Bank of Kenya / KPCU and a specialised international bank or derivative trader (the wholesale transaction). The retail transactions can take either of two forms: a floor price guarantee packaged with credit (harvesting, input finance) or a guaranteed floor price insurance on a stand-alone basis. The wholesale transaction is intended to aggregate the entire set of retail insurance transactions and offset these by selling OTC put options through an international bank or an internationally operating derivative trader.

The estimated total cost:
See CFC/EB/31/2.

Financing sought from the Fund:
See CFC/EB/31/2.

Mode of financing:
See CFC/EB/31/2.

Co-financing:
See CFC/EB/31/2.

Mode of co-financing:
See CFC/EB/31/2.

Counterpart contributions:
See CFC/EB/31/2.

Project Executing Agency (PEA):
United Nations Office for Project Services (UNOPS), Nairobi, in conjunction with a specialized risk management agency.

Supervisory Body:
International Coffee Organisation (ICO), London

Estimated starting date:
2003-04

Overview of Coffee Supply and Demand
Coffee is grown and exported by more than 50 developing countries while the major coffee consumers are industrialized countries. In recent years, coffee export earnings of developing countries have amounted to over US$10 billion annually, reflecting coffee's high importance to the balance of trade between developed and developing countries. Many African countries depend on coffee for more than 50% of their foreign exchange earnings. Ethiopia and Uganda who are participating in this project depend on coffee for more than 50% of their export earnings. Governments also earn substantial revenue through taxation on coffee. Recent analyses of supply and demand suggest that per capita consumption in some major importing countries may be falling, however, there is scope for a modest increase in consumption in producing countries. The share of the market, which is supplied by the small coffee producers, is declining, the production by small producers is declining, and the farm gate prices for small producers are declining at a faster rate than big producers because of declining quality. This project aims to pilot new ways of providing predetermined prices of coffee to small farmers.

Institutions Involved and Responsibilities
KPCU, Nairobi;
Cooperative Bank of Kenya, Nairobi;
UNOPS, Nairobi (PEA);

full name of the institution	Kenya Planters' Co-operative Union
address:	Wakulima House, Haile Selassie Avenue, P.O. BOX 72309 Nairobi, Kenya

e-mail:	kpcugm@swiftkenya.com
telephone:	(254 – 02) 210288
fax:	(254 – 02) 210258

Responsible department

title of the person(s) responsible:	Mrs. Ruth Mwaniki, general manager
mandate and core activities:	design and implement insurance facility for cooperatives (modalities, costs, etc);
support facilities to carry out:	(see Coop. Bank of Kenya)
required staff training:	(see UNOPS)
full name of the institution:	The Co-operative Bank of Kenya
address:	Head Office, Union Towers, 13th Floor P.O.BOX 48231 Nairobi, Kenya
e-mail:	
telephone:	228453, 251290
fax:	02 - 249484

Responsible department

title of the person(s) responsible:	Mrs. Dorcas W. Rigathi, manager, SCIP
mandate and core activities:	design and implement insurance facility for cooperatives (modalities, costs, etc); design and implement off setting transaction with international bank (modalities, tendering, etc);
support facilities to carry out:	marketing of credit to cooperatives in combination with price insurance
required staff training:	(see UNOPS)
full name of the institution:	United Nations Office for Project Services (UNOPS)
address:	U.N. Office Nairobi – Gigiri Block A, Room 222 P.O.BOX 30218 Nairobi, Kenya
e-mail:	RolandM@unop.org
telephone:	(254-2) 623804
fax:	(254-2) 623540

Responsible department

title of the person(s) responsible	Roland Meier, Chief Technical Adviser
mandate and core activities:	
support facilities to carry out:	required staff training

Objectives and Rationale

The rationale of the project is to assist Kenyan coffee growers in exporting countries to manage price risk and provide them a financial safety net that will enhance commodity trade and protect them against commodity price volatility. The price risk instruments will also facilitate access to finance at competitive rates by producers.

The specific objectives are:

- To carry out a survey *of* the current marketing chain in each participating country to identify potential users.
- To select price risk management instruments and the price risk management services providers.
- The development of training programmes on the application of risk management strategies and instruments through a series of awareness-raising seminars and workshops.
- The development of a system of price insurance using price risk management instruments selected.
- Dissemination of project results.

Components

The activities aim at strengthening the capacity of small coffee producers and exporters by providing them with suitable risk management tools which enable them to better plan their agricultural season. The activities are grouped under four main components.

- Selection of suitable price risk management strategies, instruments and providers and convince all actors of their usage and the authorities to provide the necessary regulatory framework.
- Set up and test the selected instruments and schemes with the main actors, farmers, co-operatives, traders, exporters and banks, commodity exchanges in the real case situation.
- Development of training programmes on the application of risk management strategies and instruments through a series of awareness raising seminars and workshops. Development of a system of price insurance using price risk management instruments and dissemination of project results through training.
- Implementation of the scheme at the national level

Benefits and Beneficiaries

The project will result in substantial benefits to farmers and the government. The management of price risk will provide a financial safety net that enhances trade and commerce in developing countries by protecting them against extreme coffee price volatility. It will help farmers and small operators to reduce credit risk and reduce financing costs. The project is an attempt to stabilise income without interfering with prices. Under this pilot project, producers will know the minimum prices to be expected for their production while preserving for themselves the benefits of any price increases. Conversely, it wilt allow small local buyers to lock in maximum prices while allowing them to benefit if prices decline. Therefore, reduced price uncertainty for farmers and for local buyers wilt be beneficial as it would provide predictability of prices and thereby incomes.

Environmental Aspects
No environmental effects of the project are expected, either positive or negative.

Costs and Financing
See CFC/EB/31/2

Monitoring, Supervision and Evaluation
The sponsoring and supervising ICB is the International Coffee Organization (ICO). The Project Executing Agency (PEA) is the United Nations Office for Project Services, which is currently implementing the Coffee and Cotton Marker Development project in Uganda, Tanzania and Zimbabwe. UNOPS, as PEA, would enhance project implementation given the experience they are gaining through implementation of the current projects. UNOPS will be required to appoint a Chief Technical Advisor to oversee the project implementation.

Both the Common Fund and the International Coffee Organization will supervise the project at the implementation stage. The collaborating institutions will play a prominent role in the project implementation. The PEA will prepare progress reports every six months.

Risk Assessment
There are a number of risks that could potentially affect implementation of the project, and hence the achievement of project objectives. The most significant risk in the project is that farmers or small traders might default on their contractual obligations to deliver to the co-operatives or exporters. This risk of non-performance of the contract will be addressed in the project before any testing of price management instruments is implemented.

Another risk factor is that the costs of the financial instruments may prove to be too high for the farmers' cooperatives to carry. There are some key legal, policy and regulatory issues which would require commitments at appropriate levels of the national government concerned and which are being addressed by the Coffee Development and Trade Promotion project.

LOGICAL FRAMEWORK

Project Title: Market Based Price Risk Management to Kenyan Coffee Farmers and Co-operatives. Estimated Project Starting Date: September 2003; Estimated Completion Date: September 2006; Date of this Summary: 15 September 2002

NARRATIVE SUMMARY

Broad programme goal:

Reduction of exposure of Kenyan smallholder coffee farmers to price fluctuations, protection of coffee revenues of Kenyan coffee smallholders against price risk and improvement of access to crop finance and other types of credit.

Project purpose:

(a) To guarantee revenues of Kenyan coffee growers andcooperatives and to improve access to credit;
(b) To make production stable and sustainable, to improve quality and to increase agricultural investment;
(c) To development a market for insuring coffee price risk;
(d) To disseminate systems in other liberalising coffee-producing countries.

Outputs:

(a) To provide price risk management instruments to farmers or their cooperatives, small traders and exporters, combined with credit or on a stand-alone basis;
(b) To link price risk management to the CFC input credit scheme so that the instruments can be attractive to both farmers and local or regional financial institutions.
(c) To give practical training on price risk management to potential users
(d) To establish policy, legal & regulatory framework for risk management transactions;
(e) To disseminate project results through publication of manuals and training brochures.

Inputs: Activities and types of resources:

(a) To organise and set up retail and wholesale transaction of price risk management schemes
(b) Technical and private sector support to establish framework and guidelines for price risk management;
(c) To conduct technical assistance and training to CoopBank of Kenya, KPCU, NCE and participating institutions.

OBJECTIVELY VERIFIABLE INDICATORS

Measures of goal achievement

An increase in

(a) share of production produced under price guarantees;

(b) number of price insurance contracts or number of credit arrangements including provisions for price risk insurance;

(c) increase in volume of turn-over of domestic coffee traders

Conditions that will indicate purpose of project has been achieved (end of project status):

(a) Price insurance offered to cooperatives on a continuous basis;

(b) Recommendations for policy, legal and regulatory reforms;

(c) Increase in agricultural credit to and investment by coffeecooperatives;

(d) Other commercial banks offer similar price insurance schemes

Magnitude of output necessary and sufficient to achieve purpose:

(a) System piloted successfully: sufficient interest and willingness to pay;

(b) Staff involved in provision of risk management capable and proficient

Level of effort/expenditure for each activity:

Component 1: design price risk management strategies and establish necessary regulatory framework.

Component 2: design, cost and modalities of wholesale and retail transaction; set up and test pilot scheme in the real case situation.

Component 3: training for promotion of awareness and dissemination of results.

Component 4: implementation of project at national level

MEANS OF VERIFICATION

Export & Customs Statistics

(a) number of cooperatives engaged in the price risk management scheme;

(b) volume and number of transations under the scheme;

Other supporting data and evidence

(a) Commercial bank reports and accounts fromcooperatives and cooperatives associations;

(b) Draft parliamentary papers and statutes;

(c) Survey of coffee traders, exporters, central and commercial banks;

(d) Monitor inquiries & follow-up actions of neighbouring countries for similar trading systems.

Evidence related to pilot:

(a) Detailed analysis of costs and benefits of tested system in project reports and appraisal by users at terminal workshop;

(b) MoA of parties involved in transaction;

(c) Survey data on cooperative transactions.

(d) detailed survey on the impact of the scheme

(e) bank statistics and statistics of instruments used

PEA Project Progress Reports.

Annual Audit Reports;

Participation in Advisory Committee and terminal dissemination workshop;

Trials of the pilot made finance system;

Periodic reports and on-site visits to assess progress in implementation;

IMPORTANT ASSUMPTIONS

Concerning long term value of project:

Interest from the side of cooperatives and coffee smallholders in securing stable incomes

Continuing political commitment to market liberalisation and to provide the supportive policy, legal and regulatory framework.

Affecting purpose to goal link:

(a) Coffee smallholders and cooperatives are willing to pay for price insurance and are capable to do so;

(b) Price volatility faced by coffee smallholders makes suggested scheme attractive;

(c) The system to be established proves to be economically sustainable.

Affecting output to Purpose link

(a) project becoming fully operational

(a) Financing from all sources is made on a timely basis in line with proposed activities and Annual Work Plan / Budget;

(b) the PEA, national management units and collaborating institutions co-ordinate & execute the project efficiently and effectively;

(c) govemments remain committed to private sector reform, diminishing the role of the state in commodity marketing and trade and enhancing smallholders' standard of living

References

In the preparation of this desk study the following web sites have been used:
FAO: www.fao.org
World Bank: www.worldbank.org
ICO: www.ico.org
IMF: www.imf.org

In the preparation of this desk study the following data source have been used:
International Financial Statistics, International Monetary Fund (IFS/IMF).
Food and Agricultural Organisation (web site).
Word Development Indicators, World Bank (WDI 2001)
International Coffee Organisation (web site)
United Nations Commodity Trade Statistics (SITC3)

In the preparation of this desk study the following publications have been used:

Akiyama, T., J. Baffes, D. Larson and P. Varangis, 2001, 'Commodity Market Reforms, Lessons of Two Decades', World Bank Regional and Sectoral Studies, World Bank.

Akiyama, T., 2001, 'Coffee Market Liberalization since 1990' in Akiyama et al. (2001) 'Commodity Market Reforms, Lessons of Two Decades', World Bank Regional and Sectoral Studies, World Bank.

Burger, K., 1994, 'Farm Households, Cash Income and Food Production, The Case of Kenyan Smallholdings', PhD thesis, Vrije Universiteit Amsterdam.

Common Fund for Commodities, 2000, Technical Paper No. 3, Study of Marketing and Trading Policies and Systems in Selected Coffee Producing Countries.

Common Fund for Commodities, 2001, 'Pilot short and medium term finance to small scale coffee farmers in Kenya (CFC/ICO/20), Final Appraisal Report.

Fitter, R. and R. Kaplinsky, 2001, 'Who Gains From Product Rents As The Coffee Market Becomes More Differentiated? A Value Chain Analysis' , Institute of Development Studies, IDS Bulletin Paper, May.

Gilbert, C.L. and W. Zant, 2001, 'Restoring Balance by Diversion in the World Coffee Market', report to ICO.

de Graaff, J., 1986, The Economics of Coffee, in 'The economics of crops in developing countries series, no. 1, PUDOC, Wageningen, The Netherlands.

International Coffee Organization, 1997, Coffee Profile Uganda, London.

International Coffee Organization, 2000, Coffee Profile Kenya, London.

International Coffee Organization / Common Fund for Commodities, 2000, ' Marketing and Trading Policies and Systems in Selected Coffee Producing Countries: Country Profile Ethiopia', LMC, London.

International Task Force on Commodity Price Risk Management (ITF), 2001, 'Tanzania: Coffee Price Risk Management, Phase II Report', June.

International Task Force on Commodity Price Risk Management (ITF), 2002, 'Uganda: Coffee Price Risk Management, Phase II Report', February.

Karanja, A.M., 2002, Liberalisation and Small-holder Agricultural Development: A Case

Study of Coffee Farms in Central Kenya, PhD Thesis, Wageningen University, The Netherlands.

Klugman, J., B.Neyapti and F. Stewart, 1999, 'Conflict and Growth in Africa', Volume2: Kenya, Tanzania and Uganda; Development Centre Studies, OECD.

Komba, L.C., L.N. Donge, A.P.Rutabanzibwa and M.S.Muya, 2001, Taarifa ya Kamati Maalum ya Rais ya Kumshauri Juu ya Kufufua, Kuimarisha na Kuendeleza Ushirika Tanzania, Dar es Salaam.

Larson, D., 2001, 'Weather Insurance Project Study: Ethiopia', World Bank, internal mimeo.

LMC International, 2000, 'The Use of Market Based Commodity Risk Management Techniques in Commodity Dependent Developing Countries: Perceptions, Opportunities, Constraints, Accessibility to Small Scale Producers', Final Report prepared for the European Commission.

Love, R., 2001, 'A Note on Farmers' Share of Coffee Prices In Ethiopia and their Relative Volatility', Sheffield Hallam University.

Temu, A.A., A.Winter Nelson, P. Garcia, 2000, 'Market Liberalisation, Vertical Integration and Price Behaviour in Tanzania's Coffee Auction', University of Illinois, research paper.